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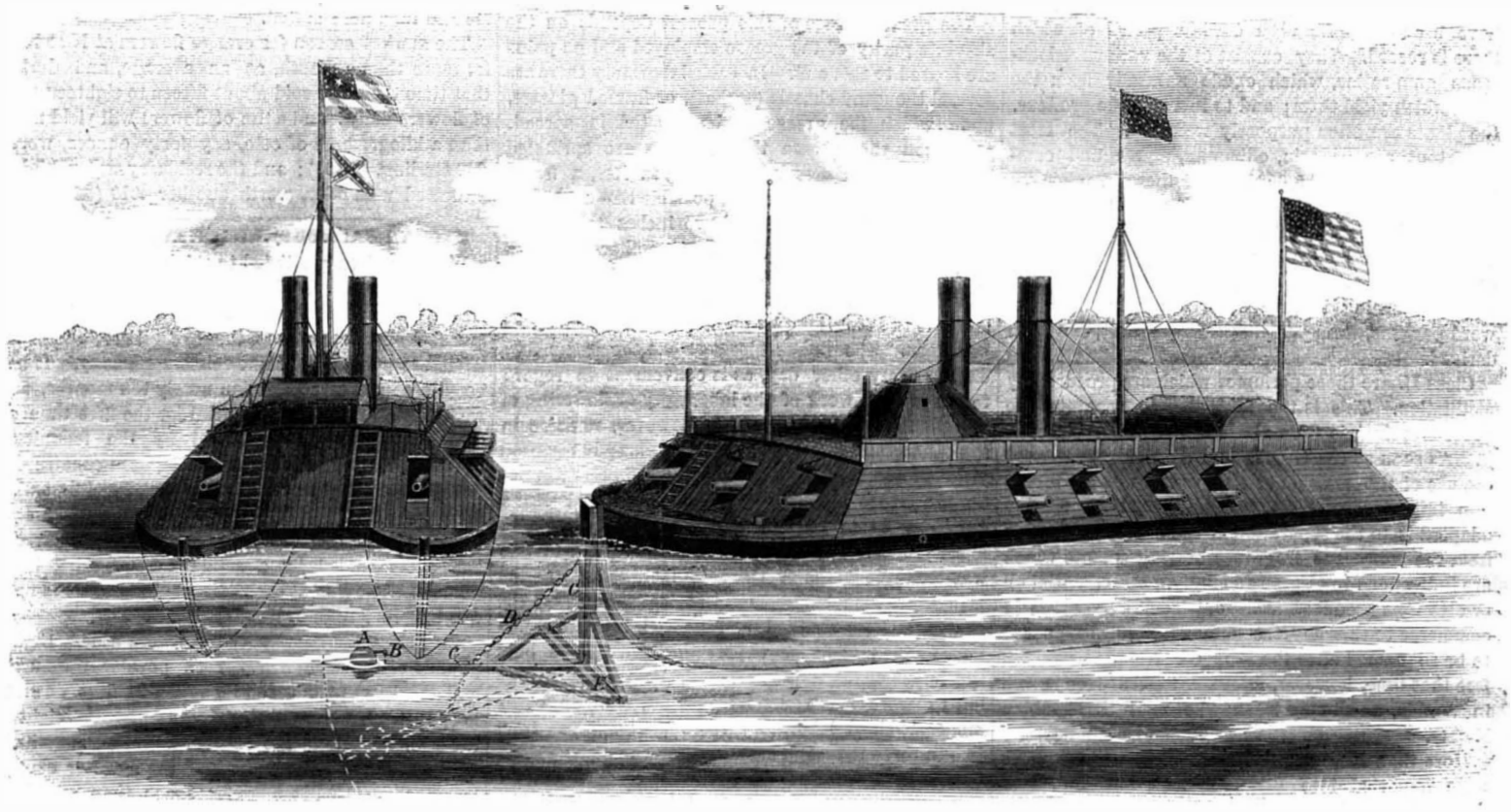
THE DESTRUCTION OF THE REBEL RAM "ALBEMARLE."

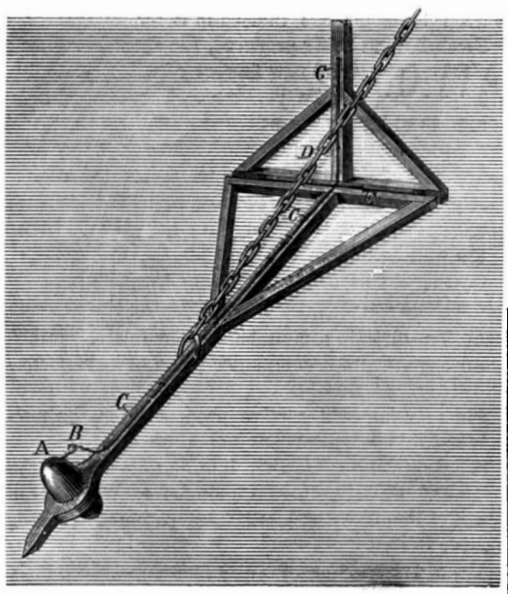
The appended article is forwarded by the inventors of the plan here illustrated:—

The ingenuity and daring of the gallant Lieut. Cushing, in the exploit which destroyed the rebel ram *Albemarle*, and rid the federal navy of its principal annoyance and the nation of a formidable and constant menace, has caused universal rejoicing among our own people and excited the admiration of the world. The writer of this article would not confess himself second to any in rejoicing at the deliverance, or in admiration of the brave and heroic conduct of the deliverer. Nor does due honor to him demand that the just meed of praise, or at least of recognition, be withheld from any other who may deserve it at the hands of his countrymen.

The reader will perhaps be surprised to learn that the plan adopted or invented by the adventurous Cushing for the destruction of the *Albemarle*, was one of the but recently "rejected proposals" of the Navy Department. Yet such is the fact. As early as August 9th, 1862, drawings and a description of a "Portable Submarine Battery," for the destruction of rebel gunboats and ships, combining the essense of Cushing's plan with some advantages, obvious on casual inspection, were submitted to the Navy Department by Lieut.-Colonel Geo. V. Rutherford, at that time Assistant Quartermaster-General of the State of Illinois, now a Colonel in the Quartermaster's Department at Washington. The Department decided that "the present state of naval warfare precluded the possibility of adopting this style of invention." How their decision has been approved by the results of Cushing's bold experiment the country knows, rejoicingly, and recognizes in it another instance of that hasty official judgement which frowns upon invention as impertinent innovation, and which would keep the world forever running in the ruts of old fogyism, but for the persistence and courage of genius which overrides all obstacles, and often by a single daring action refutes the learned objections and doubts of erudite officials and fossilized philosophers.

Hereto are appended copies of the correspondence of the inventor with the Navy Department, comprising an intelligent description of the "Battery," and the manner of its disposal by the "Permanent Commission." It is hardly necessary to add that the "ramming" "state of naval warfare," inaugurated from the first, seems to especially call for the "adoption of this style of invention," and that it was, indeed, that alone which suggested the contrivance.





QUARTERMASTER-GENERAL'S DEPARTMENT, SPRINGFIELD, Ill., August 9th, 1862.

SIR:—I respectfully submit to your consideration a plan for destroying the rebel gunboats or ships of war. The diagram explains itself, showing the manner in which a bomb or torpedo is to be carried under and brought up against the bottom of the hull of the vessel, where it may be discharged either by a galvanic wire and battery, or friction-primer and lanyard, properly protected from the water, by tube and air-tight casings, A being the torpedo; B the friction primer; C the supporting frame; D the elevating chain, and E the hinge or joint, which enables it to be raised or lowered. In order to appreciate its practicability it has only to be borne in mind that powder, exploded under water, has no downward, scarcely any lateral, but mainly a vertical expansion; indicating that a shell so exploded would be unattended with danger to the attacking vessel, unless from the falling fragments from the blown-up gunboat, which by proper experiment and precaution can be guarded against. I am impelled by no other motive than a desire to serve my country and the advice of scientific friends, in obtruding this upon your attention. I have only to add that I hold myself in readiness to superintend any experiment that it may be thought desirable to test the merits and efficacy of this machine. Very respectfully, your obedient servant,

GEO. V. RUTHERFORD,
Asst. Q. M. General, State of Illinois.

Hon. GIDEON WELLES, Secretary of the Navy, Washington, D. C.:

NAVY DEPARTMENT, August 19, 1862.

Lieut.-Col. G. V. RUTHERFORD, A. Q. M. General, SPRINGFIELD, Ill.:

COLONEL:—Your communication with drawings of your "Portable Submarine Battery," has been received. The appropriation made by Congress for experiments having been expended the Department has no authority to incur any expense in testing the merits of your machine. Very respectfully,

GIDEON WELLES, Secretary of Navy

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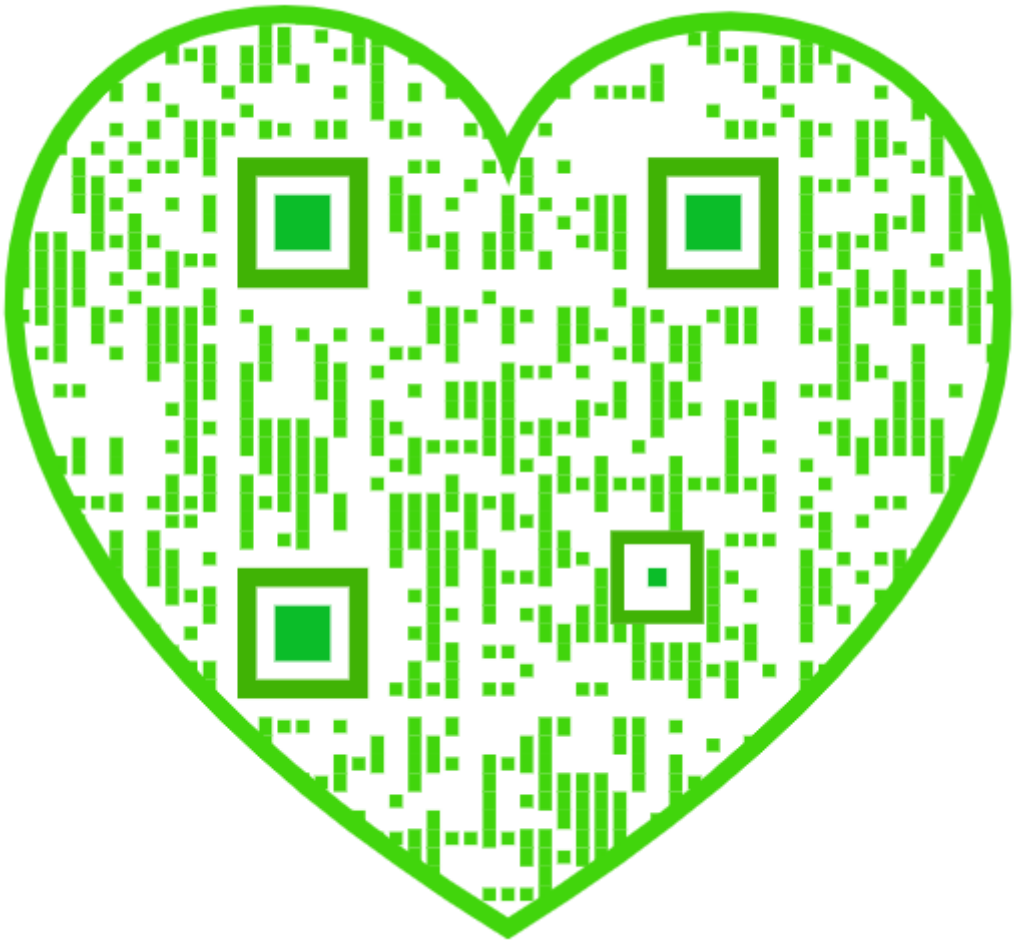

NAVY DEPARTMENT, PERMANENT COMMISSION, March 31st, 1864.

SIR:—We have the honor to report that the commission has had under consideration and examination a plan of Mr. G. V. Rutheford for destroying gunboats or ships of war. The present state of naval warfare precludes the possibility of adopting this style of invention. Very respectfully, your obedient servants,

C. H. DAVIS,
Chief of the Bureau of Navigation.
A. D. BACHE,
Supt. U. S. Coast Survey.
JOSEPH HENRY,
Secretary Smithsonian Institute.

Hon. GIDEON WELLES, Sec. of Navy.

LECTURE ON PERFUMES.

We have received from Septimus Piesse, Ph. D., F. C. S., a copy of a lecture on perfumes, delivered by him before the Royal Horticultural Society, and we select from it the following extracts:—

THE THREE CLASSES OF PERFUMES.

Perfumes that are derived from plants may be, for the purpose of description, conveniently divided into three classes. Class I. are the most ancient, and have been in use from the earliest period of which there is record. They consist of the various odoriferous gum-resins, which exude naturally from the trees which yield them; and to increase the produce, the plants are often purposely wounded. The most important are benzoin, olibanum, myrrh and camphor. No less than 5,000 cwt. of these together are annually imported into Great Britain. Gum-resins form the chief ingredients in incense, and in pastilles. These odorous bodies are principally consumed in certain religious ceremonies, and from the early custom of burning incense upon the holy altar, our word perfume, from *per fumus* (by smoke), has been derived.

Class II. are those perfumes which are procured by distillation. This is the first step to separate the odorous principle from the material which contains it. As soon as the Greeks and the Romans learned the use of the alembic or still, which was an invention imported by them from Egypt, they quickly adapted it to the separation of the odorous principle from the numerous fragrance-bearing plants which are indigenous to Greece and Italy. An essential oil or otto thus produced from orange-flowers bears in commerce to this day the name of Neroly, supposed to be so named after the Emperor Nero. Long before that time, however, fragrant waters were in use in Arabia, as all may learn who read the Arabian Nights.

More than 200,000 pounds-weight of various ottos were imported into Britain in 1860, and valued at £180,000; to this must be added at least one-third as much again distilled in England. Of the imported articles enumerated, oils of lemon and bergamot, from the Two Sicilies, reached 128,809 pounds, valued at £57,054.

We now pass to class III. These are the purfumes proper, such as are used for perfuming handkerchiefs. It will have been observed, that hitherto I have not spoken of the fragrance from any flower, but only of those odors which are derived from either the leaves, the wood, the fruit, the root, or the seed of the plant. What we have now to say refers more particularly to the perfumes derived from flowers.

PROCESS OF ENFLEURAGE.

Contrary to the general belief nearly all the perfumes are not made by distillation, but by the processes of enfleurage or inflowering and by maceration or infusion.

The odors of flowers do not, as a general rule, exist in them as a store or in a gland, but they are developed as an exhalation. While the flower breathes it yields fragrance, but kill the flower, and fragrance ceases. It has not been ascertained when the discovery was made of condensing, as it were, the breath of the flower during life; what we know is, that if a living flower be placed near to butter, grease, animal fat, or oil, these bodies absorb the odor given off by the blossom, and in turn themselves become fragrant. If we spread fresh unsalted batter upon the inside of two dessert plates, and then fill one of the plates with gathered fragrant blossoms of clematis, covering them over with the second greased plate, we shall find that after twenty-four hours the grease has become fragrant. The blossoms, though separated from the parent stem, do not die for some time, but live and exhale odor, which is absorbed by the fat. To remove the odor from the fat, the fat must be scraped off the plates and put into alcohol; the odor then leaves the grease and enters into the spirit, which thus becomes "scent," and the grease again becomes odorless.

The flower farmers of the Var follow precisely this method on a very large scale, with but a little practical variation, with the following flowers: rose, orange, acacia, violet, jasmin, tuberose and jonquil. The process is termed, as said before, enfleurage or inflowering. In the valley of the Var there are acres of jasmin, of tuberose, of violets, and the other flowers named; in due season the air is laden with fragrance, the flower harvest is at hand. Women and children gather the blossoms which they place in little panniers like fishermen's baskets hung over the shoulders. They are then carried to the laboratory of flowers and weighed. In the laboratory, the harvest of flowers has been anticipated. During the previous winter great quantities of grease, lard, and beef suet have been collected, melted, washed and clarified.

The great success of this process depends on the absolute purity of the grease employed and no pains are spared to this end. In each laboratory there are several thousand chassis (sashes), or framed glasses, upon which the grease to be scented is spread, and upon this grease the blossoms are sprinkled or laid. The *chasse en verre* is, in fact, a frame with a glass in it, as near as possible like a window sash, only that the frame is two inches thicker, so that when one chasse is placed on another there is a space of four inches between every two glasses, thus allowing room for blossoms. Every chasse, or sash, is about two feet long by eighteen inches broad, as here seen. The flower blossoms are changed every day, or every other day, as is convenient in regard to the general work of the laboratory or flowering of the plants. The same grease, however, remains in the chasse so long as the particular plant being used yields blossoms. Each time the fresh flowers are put on, the grease is "worked"—that is serrated with a knife—so as to offer a fresh surface of grease to absorb odor. The grease being inflowered in this way for three weeks or more—in fact, so long as the plants produce blossoms—is at last scraped off the chasse, melted, strained and poured into tin canisters, and is now fit for exportation. We have here specimens of fat thus inflowered, jasmin fat, orange fat, tuberose fat, violet fat, rose fat, etc. In every moderate-sized laboratory there are employed from two to three thousand sashes.

PROCESS OF MACERATION.

Fat or oil is perfumed with these same flowers by the process of maceration; that is, infusion of the flowers in oil or melted fat. For this end, purified fat is melted in a *bain marie*, or warm bath, and the fresh blossoms are infused in it for several hours. Fresh flowers being procured, the spent blossoms are strained away and new flowers added repeatedly, so long as they can be procured. The *bain marie* is used in order to prevent the grease becoming too hot from exposure to the naked fire; so long as the grease is fluid, it is warm enough. Oil does not require to be warmed, but improved results are obtained when it is slightly heated. We have upon the wall here a sketch showing the water bath for melting the fat or warming the oil.

Jasmin and tuberose produce best perfumed grease by enfleurage, but rose, orange, and acacia give more satisfactory products by maceration; while violet and jonquil grease is best obtained by the joint processes—enfleurage followed by maceration.

EXTRACTING THE ODOR FROM THE FAT.

In order now to obtain the perfume of these flowers in the form used for scenting handkerchiefs, we have to infuse the scented fat or oil, made by any of the above methods, in strong alcohol, that is rectified spirits of wine.

In extracting the odor from solid fat it has to be chopped up fine as suet is chopped, or melted, and then put into the spirit, and left to infuse for about a month. In the case of scented oil it has to be repeatedly agitated with the spirit. The result is, that the spirit extracts all the odor from the fatty body, becoming itself "perfume," while the grease again becomes odorless; thus is procured the essence of jasmin, essence of orange flowers, essence of violets, and others already named—rose, tuberose, acacia and jonquil. Several specimens are here shown.

It is remarkable that these flowers yield perfumes which, either separate or mixed in various proportions, are the types of nearly all flower odors; thus, when jasmin and orange flowers are blended, the scent produced is like sweet pea; when jasmin and tuberose are mixed the perfume is that of the hyacinth. We will practically exemplify this thus; all the various bouquets and nosegays, such as "frangipanni," "white roses," "sweet daphne," are made upon this principle.

THE FLOWER HARVEST OF CANNES.

The commercial importance of this branch of perfumes may be indicated by the quantity of flowers annually grown in the district of Cannes. Flower harvest: orange blossoms, 1,475,000 lbs.; roses, 530,000 lbs.; jasmin, 100,000 lbs.; violets, 75,000 lbs.; acacia, 45,000 lbs.; geranium, 30,000 lbs.; tuberose, 24,000 lbs.; jonquil, 5,000 lbs. The quantity produced at Nice I have been unable to ascertain; with violets and orange there are more, but with Cassie less than here stated.

The market season for orange flowers at Nice lasts for more than a month, as an average, and during that time there are sold about fifteen to eighteen tuns of flowers daily! and a tun of flowers will yield more than a kilogramme of otto, say forty ounces, worth £20 sterling, ($100); and the residuary water, highly saturated with odor, worth another £10 ($50) note.

The Twenty-inch Navy Gun.

We have already alluded to this gun on page 280 of the present volume. We now give some account of its trials with heavy charges. The great gun is nearly four feet shorter, but has the same bore, and is intended to possess the same relative capacity, It has been in course of completion nearly ten months, and was placed in position for trial for the first time on Thursday. It was suspended by the trunnions, breech and muzzle, the sling having been constructed for the special purpose. It was charged first with sixty pounds of powder, and subsequently two successive charges of the same amount of powder, the last accompanied by a solid shot weighing 1,080 pounds. The gun at each discharge vibrated about one-half its length in its slings.

On Friday the heavier charges were tried. Eighty pounds of the usual heavy rock powder were used, and the 1,080 pound solid shot was sent down to keep it there. Notwithstanding the great weight of the gun, the size of the charge, and the magnitude of the solid shot, the loading of the monster cannon was accompliseed in a briefer space than would require us to write the account. Three 80-pound charges were fired, and, as an old salt remarked, that they were "beautiful to hear." To a sensitive tympanum the shock of this gun is pleasant in comparison with that produced by a 9-inch Dahlgren.

A charge of 100 pounds was next introduced, the solid shot sent home, the percussion arranged, when Mr. James Knapp pulled the lanyard. The ball struck the stony bank, and tuns of rock fell into the cavern, already existing from similar ponderous blows.

This time the gun recoiled about two-thirds of its length in the sling, and the concussion scarcely differed from that experienced with the 80-pound charges. A second charge of 100 pounds was fired, and immediately after the recoil, a wrought-iron bolt, three inches in thickness, suddenly snapped, and the breach-band broke, letting the enormous mass to the ground, crushing as if they were made of timber, the T-rails beneath.

This sudden accident brought the test to a conclusion. Captain Yard, United States Navy, who superintended the test, expressed himself highly gratified with it. The gun had done its duty so far as the preliminary examination was concerned, and the accident that brought it to a termination before the final charge was fired—but one remaining to complete it—was regretted by all present.

THE striped bug, says Dr. Trimble, so destructive in melon and cucumber beds, may be effectually got rid of by cooping a hen with a brood of small chickens near the vines. The little chicks will hunt and destroy the bugs, without injury to the plants.

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RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Iron-clad and Other Vessels.—This invention consists in the application to a vessel of a hinged adjustable shifting keel connected to the main keel and operated by chains or other suitable means in such a manner that it can be turned down to a perpendicular position whenever it may be desirable to increase the steadiness of the vessel, or that it can be turned up on the side of the main keel if the latter is deemed sufficient to keep the vessel steady. The invention relates also to certain improvements in the gear for operating the turret, also to a certain novel arrangement for operating steam rams and scuttling rams or augers extending through the sides of the vessel and calculated to produce holes in a hostile vessel, either by blows or by boring such holes, as may be most convenient. Charles Slater, Brooklyn, N. Y., is the inventor.

Printing Press.—This invention relates to a new and improved printing press for general use, but more especially designed for printing labels or small bills, etc. The object of the invention is to obtain a press of simple construction by which any person can do his own printing in a small way. Druggists, for instance, print their own labels, storekeepers their own circulars, bill-heads, etc., etc. The invention will prove valuable in those cases where dates are put on labels, and consequently require to be changed every day, and where the titles on labels are frequently changed. Henry Redlich, Chicago, Ill., is the inventor.

Ore Separator.—This invention relates to a new and improved device for separating the heavier masses of ore from the lighter portion or "slime" as it is technically termed, and it consists in the employment or use of a hopper provided with a deflecting board and a chute, and also provided with an exit chamber having a pipe or tube communicating with it and provided with faucets or plugs, all arranged in such a manner as to effect a complete separation of the two parts of the ore specified. James Watson, Cliff Mine, Mich., is the inventor.

Composition for Preparing Ribbons for Hand Stamps, Etc.—In certain classes of hand stamps ink-prepared ribbons are used, which are drawn through between the die and the bed, and give the impression when the die is depressed. For the purpose of preparing these ribbons ordinary printing ink has been used in the absence of some better composition, and a ribbon thus prepared will give about thirty impressions on the same spot. The composition which forms the subject matter of this invention, and the coloring base of which is one of the aniline colors, when properly mixed and applied to the ribbon allows of taking more than a hundred impressions from the same spot; in fact, the color seems to be inexhaustible, and is, therefore, of great value for the purpose above stated. Horace Holt, No. 264 Broadway, is the inventor.

Oil Press.—This invention consists in the use of doors sliding in grooves in the adjoining movable sides of the press boxes, said grooves being arranged in such a manner that they retain the slides firmly in position, and compel them to close tight when the press is filled, and at the same time they do not interfere with the sliding motion of the sides of the press boxes. The invention consists also in the application of a steam supply and of an exhaust pipe, extending over the entire length of the press, and communicating with each press box by small pipes, in such a manner that said small pipes will have sufficient spring to allow the sides of the press boxes being moved the requisite distance, and all complicated joints in thin pipes can be avoided. Wm. V. McKenzie, Jersey City, N. J., is the inventor.

Circular Cutter.—The object of this invention is to cut out circular disks or rings of india-rubber or other material, such as is used for the packing of flanges and other circular parts of steam engines and other machines. To effect this purpose a movable knife holder is secured to a rod provided with a rule and with a screw handle, and fixed center, in such a manner that the knife can be readily adjusted to any desired distance from the fixed center. By turning the handle the knife holder can be released or fastened at any desired point on the rule. The fixed center is secured in a stationary head provided with a swiveling arm rest, in such a manner that the operator is enabled to press the fixed center down with his arm, and take hold and operate the knife with the hand, while his other hand is free to hold the material and move it against the knife, and the cutting operation will be executed in a short time with care, and with perfect exactness. Emil Hubner, New York city, is the inventor.

Fire-arm.—This invention consists, among other things, in forming the lock frame and the guard in one piece, and in so connecting the frame to the receiver as to be removable by the withdrawal of the pin on which it rotates; also in a novel method of forming the shell drawer for withdrawing the empty shell of the cartridge, and in other devices and modes of operation which are considered to be valuable improvements in breech-loading fire-arms. The patent bears date April 18, 1865. Albert M. White, Port Chester, Westchester Co., N. Y., is the inventor.

BOOKS AND PUBLICATIONS.

ATLANTIC MONTHLY.—The May number of this standard periodical has a leading article upon birds of America, which, in a discursive and genial way, tells us all about our feathered friends—those familiar to us from constant flitting about our houses, and those afar off who haunt the woodside or the depths of the forest. Every lover of nature will read the article with pleasure. The poetry of the May number is not remarkable for depth, feeling, or originality of thought—"Gold Egg; a phantasy," being as fantastical in meter as it is vague and misty in purpose. "Out of the Sea" is a local romance, with a vigorous, fresh life and tone, and other tales, together with Mrs. Stowe's always welcome and popular, because sensible, articles on topics of everyday interest, make this number a most entertaining one. Sold by all booksellers and newsdealers.

GAZLAY'S PACIFIC MONTHLY.—This magazine is a new comer in the field of periodical literature. It is intended for circulation in California principally, and has articles bearing upon topics interesting to the people of that State. It is printed very handsomely, and is published in New York at No. 34 Liberty street.

DEMOREST'S MONTHLY MIRROR OF FASHIONS.—This magazine is chiefly valuable for the attractions it presents to modistes and housekeepers generally in the very elaborate set of paper patterns which accompany each number, and which would cost if bought on Broadway more than the price of a year's subscription. By consulting this periodical our readers in remote towns can have the earliest fashions brought to their firesides. In addition, there are recipes for cooking which are also valuable to those who consider taste any object in culinary matters. Published by W. I. Demorest, New York.

The Russian Epidemic.

There seems to be no occasion for alarm in regard to the epidemic prevailing in Russia. In the French Academy of Medicine it is declared to be typhus fever, a disease wholly unknown in this country except among crowds of foreigners just landed from emigrant ships. Our common typhoid fever is so named because it resembles the typhus in some of its symptoms, but it is an entirely distinct disease, characterized by ulceration of the bowels. Dr. Murchison, physician to the London Fever Hospital, writes to the *London Times* this full account of the Russian epidemic:—

If the details furnished by foreign physicians are to be relied on, it is not a new pest which has invaded the world, nor has the disease any relation whatever to Asiatic cholera. The malady is evidently relapsing fever, which, under different designations, has been well known in Britain and Ireland for nearly two centuries, which constituted a great part of the Irish epidemic of 1847, and which about the same time was very prevalent in Upper Silesia and in other parts of Germany. The Russian disease corresponds with relapsing fever in every particular save one—viz., its great fatality; but this difference is apparent rather than real, and is attributable to an admixture of ordinary typhus. The mortality from relapsing fever has rarely exceeded three per cent; but almost all epidemics of relapsing fever have coexisted with epidemics of typhus, of which the average mortality is nearly 20 per cent. Hence the aggregate mortality of an epidemic of the two diseases varies with the proportion of typhus. One peculiarity of relapsing fever is that it prevails in great epidemics, and then entirely disappears for years. In 1851 more cases of relapsing fever were admitted into the London Fever Hospital than of any other fever, but for upward of ten years not one case has been observed. The intervals between some of the epidemics have been so long that time has been afforded for a new generation of medical men to spring up having no experience of the disease, and who, on the occasion of a fresh outbreak, have imagined that they were encountering a new malady. So it was in Scotland in 1843, and so it is now in the case of the Russian epidemic. The causes assigned for the Russian epidemic are the crowding into St. Petersburg of 43,000 laborers in search of work, but more particularly the unusual destitution among the poor, and their recourse to unwholesome food, such as bread containing a large quantity of horned rye. The epidemic, we are told, is "exclusively confined to the poorer classes." In this respect the relapsing fever of Russia is not singular. In this country the disease has always been confined to the poorer classes.

The Way Tar is Obtained.

In compliance with the request of a correspondent we publish this description of the process of procuring tar, which we take from an article on the subject in Appleton's New American Cyclopædia:—

Tar, a thick, black, viscid material, a product of the destructive distillation of carbonaceous substances, as wood, peat, bituminous coals and shales. It is a commercial article, largely produced, and applied to a variety of uses. It was known to the ancient Greeks, and Dr. Clarke, who describes the method of manufacturing it in the forests of Bothnia, states that there is not the smallest difference between the processes there practiced and those of ancient Greece. Along the whole coast of the Gulf of Bothnia the inhabitants are very generally engaged in this occupation. They make use of the roots of the fir trees, with logs and billets of the same, which they arrange in a stack of conical shape, fitted to a cavity in the ground, generally made in the side of a bank. In the bottom of this cavity is placed a cast-iron pan from which a spout leads out through the bank. The heap is covered over with turf, and is then fired, as in making charcoal. Tar collects in the latter part of the process of charring, and runs off through the spout into barrels placed to receive it. Tar is a product, where charcoal is the chief object of the process, but is seldom obtained in quantities sufficient to render it an object to collect it, except in charring the resinous woods of the pine family. In Sweden, where the business is also an important one, some peculiar methods are adopted to increase the yield of tar in wood. Trees of no value for the saw-mill are partially peeled of their bark a fathom or two up from the ground, not enough to kill them, but only to check their growth. After five or six years, when cut down, the wood is found to be much richer in resinous matters which produce tar. It is noticed that the condition of the weather during the process of charring may make a difference of 15 or 20 per cent in the yield of tar. In the United States tar is produced in almost all parts of the country where pitch pine and the *pinus australis* are found. Along the coast of the Southern States, especially of North Carolina, Virginia, and Georgia, the business has been carried on upon a large scale in connection with the manufacture of turpentine, rosin, and pitch. Old trees, which have ceased to produce turpentine, and dead wood which is rich in resinous matter, are selected for the coal pits. The process does not materially differ from that already described.

VEGETABLE ORIGIN OF DIAMONDS.—Prof. Gœppert, who recently obtained the prize offered by the Dutch Scientific Society for an essay on this subject says:—"In my essay I have given ample proof that at one time diamonds were soft bodies. I have not yet attained any results with respect to graphite, but in diamonds I have found numerous foreign bodies inclosed, of which, if they cannot be said to be evidently and undoubtedly vegetable in their origin, it would, on the other hand, be difficult to deny their vegetable nature altogether."—*Seemann's Journal of Botany.*

MM. MOUTIER and DIETZENBACHER have been investigating the modifications of the physical properties of sulphur which are produced by minute quantities of carbon. They find that sulphur, when heated to 270 deg., in contact with carbon, absorbs about one-tenth per cent of that body, and is thereby rendered soft and plastic. Minute quantities of iodine, and of several other bodies, are similarly absorbed by sulphur, and similarly modify its properties.

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Improved Parallel Ruler.

In mechanical drawing parallel rulers are indispensable, and, as the inventor of the one here shown says, the ordinary one is very defective. When opened they continually move to one side and from the work, which is inconvenient. They are likewise liable to become untrue, for if the connecting bars are not hinged at the same angle, or if one joint gets worn more than the other, the lines will not be parallel.

The engraving represents a new parallel ruler which is a very desirable improvement, and a useful addition to the draughtsman's case. It may be moved in parallel lines directly from the operator, by simply working the pinions, A and B, which mesh in appropriate racks, said racks being fixed to crossp.eces dovetailed to the rulers themselves. The toggle-jointed bars, C, cause the rulers to move in either direction, as before explained, and by the number of joints the wear of each individual one is lessened, so that greater durability is combined with efficiency in this instrument. It is also light and free from sharp points liable to stick in the paper and mar the drawing. A patent was procured on this invention through the Scientific American Patent Agency on the 14th of February, 1865, by E. C. Gillette, of San Francisco, Cal., temporarily residing in Richfield, British Columbia. For further information address Henry Lyon, No. 119 Nassau street, New York.

Fig. 1

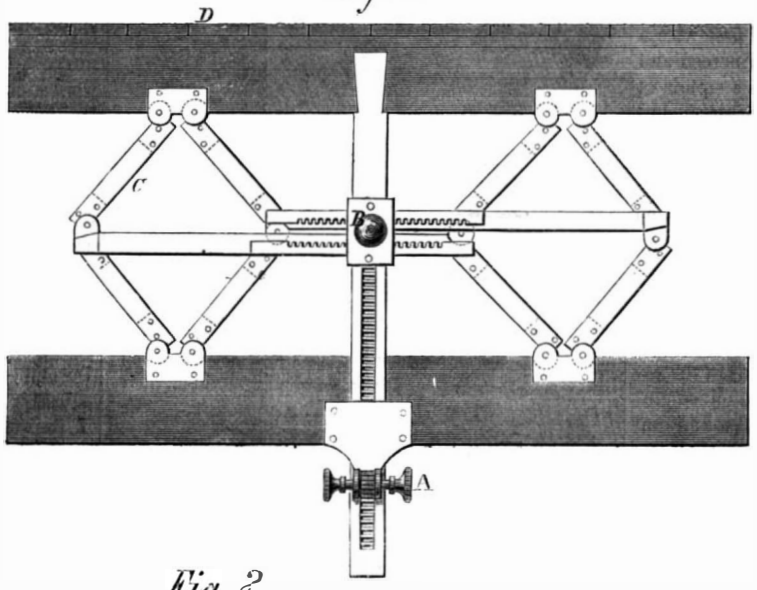
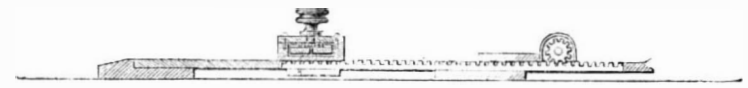


Fig. 2



GILLETTE'S PARALLEL RULER.

Drainage Works of London.

On the 4th of April last there was a celebration in London on account of the opening of the main drainage works of that city, by which the Thames river is to be purified or relieved of the refuse matter of the city which has been poured into that stream. The London *Times* gives a very extended account of these works.

The river runs through the center of the city, which stands on the north and south sides of it, and receives all its drainage. It is desired to intercept this matter before it reaches the stream, and the contents of the sewers carried off in another direction. It became necessary to construct certain main sewers of great length and capacity to receive this refuse. There are three great main lines of sewers, or rather tunnels, which run from the extreme west to the extreme east of the metropolis, and which are laid at angles to all existing sewers and a little below their levels, so as to intercept their contents and convey them to an outfall 14 miles below London bridge. As large a proportion of the sewage as practicable is by this means carried away by gravitation, and for the remainder a constant discharge is effected by pumping. At the outlets the sewage is delivered into reservoirs situated on the banks of the Thames, and placed at such a level as will enable them to discharge into the river at or about the time of high water. By this arrangement the sewage is not only at once diluted by the large volume of water in the Thames at high water, but is also carried by the ebb tide to a point in the river 26 miles below London bridge, and its return by the flowing flood tide within the metropolitan area is effectually prevented. The work required the highest engineering skill. Tunnels have been carried under railways, streets, water-courses and highways. Foundations have been laid in all varieties of shifting ground, from peat to quicksand. One whole mile of tunnel was driven under the town of Woolwich. The ordinary drains of the metropolis are, in the aggregate, about 1,300 miles in length, and it required 82 miles of main sewers to intercept their contents from the Thames. The cost of the work has been £4,000,000. Six-sevenths of it has been completed, and London is now the best drained city in the world. The improved health of the city already attests the importance of the work.

THE recent demand for black and white muslins caused an advance of 15 per cent.

Malleable Cast Iron.

On the 3d of April, Mr. Zerah Colburn read a paper before the Society of Engineers in England on certain methods of treating cast iron. We extract the portion in relation to making castings malleable:—

"The next point to be considered is the treatment for making castings malleable. I should have said nothing of this were it not that, although exceedingly simple, it is but very little understood, for it is a very common notion that many and curious 'chemicals' are required, and that there is much mystery in the process. Making iron malleable was, indeed, among the lost arts, and old records show that it was lost and rediscovered more than once. The French philosopher Reaumur, who wrote upon it 140 years ago, observed that it was then practiced as a great mystery in Paris. At last chemistry came to the aid of the metal worker, and he learned that what he had so long called sulphur in the iron—and sulphur was once a name applied to many substances—was really carbon, the same as charcoal or diamond. And chemistry showed how carbon would always forsake iron for oxygen, and that cast iron, treated with oxygen, was made malleable, as it always is, whether in the old refinery fire, in puddling, in pig boiling with forge scales and refinery cinder, in the Bessemer process, and in still other modes of treatment. In 1804, Samuel Lucas, of Sheffield, turned his knowledge practically to account. He took out his patent, too, and described his improvement very clearly; and, to put it in the fewest words, it was nothing more than the present process of making castings malleable by roasting them, at a high heat, from 72 to 120 hours in powdered hematite iron ore, or in any metallic oxide. The oxygen of the ore unites with the carbon in the iron casting, which, being thus left without carbon, becomes malleable—malleable, indeed, to a remarkable degree. It is commonly said that castings intended to be malleableized should be from very hard, brittle iron. It is not exactly because a casting is brittle that it is of the best sort for the malleable iron treatment, but brittle castings contain less carbon than those from gray iron, and so the malleable process does not have to be so long continued to get rid of it. To those who are not accustomed to consider all forms of iron and steel as combinations merely of iron and carbon in different proportions, there is something a little paradoxical in the fact that a gray iron containing much carbon is tough; a white iron, containing less carbon is brittle; while wrought iron, containing but little carbon, is very tough. Even to a chemist these facts are not easy to be explained; nor shall I examine them further here, it being sufficient merely to have shown why a white and brittle cast iron, such as some of the Ulverstone iron of which clock bells are made, is the best for the malleable iron process, because it contains less carbon than a gray iron. The castings must be packed perfectly air-tight in layers of powdered ore, and shut up in cast-iron boxes, of which the joints should be luted. The natural ore used for purifying gas at the various stations of the Chartered Gas Works would, no doubt, answer very well for malleable castings, although it cannot be said whether Mr. Hill's oxide would do as well. The goods should be heated very gradually, twenty-four hours being occupied in getting up, and twenty-four hours more in letting down the heat, beside the two or three days at full heat. The heat should be very even over all parts of the goods, and while the full heat is on it should be kept constant by careful firing and attention to the draft. The iron ore may possibly fuze upon the surface of the casting, thus covering it with lumps or warts; but this is the result of too high a heat, or of access of air. Oxide of zinc, which is abundant in some parts of America—as near New York—is preferable to iron ore, but those who cannot obtain the former can get on very well with the latter. The agricultural implement makers have turned the properties of malleable cast iron to good account for the tines of their cultivators. At the large works of my friends, Messrs. Howards, of Bedford, unusually large pieces are made malleable by roasting in hematite ore. McHaffie's malleable castings—and for which it is generally supposed that there is a patent, although I believe there is none—are no doubt made in much the manner described, as also, no doubt, are Crowley's, of Sheffield, although different makers add various chemical substances, which may act in the same manner as the iron ore, and thus, to a certain extent, replace it, although it is doubtful if they greatly promote its real action.

Wherever a shape can be easily made in wrought iron this is probably cheaper than a malleable casting, and it is doubtful, therefore, whether the latter will ever be extensively used. It may be added that the tensile strength of malleable castings varies according to their size, and the depth to which the decarburization extends. If they were freed of their carbon all the way through, they would be converted into wrought iron, or, say, 'homogeneous metal,' as the softest kind of steel has been called. So much of the casting, however, as is not decarbonized by the malleable iron treatment remains cast iron, and has only the strength of cast iron. The effect of the process is generally visible for only a small depth below the surface, but small malleable iron castings have borne a tensile strain of 50,000 pounds per square inch."

Velocity of Liquids Through Siphons.

John Galletly has published the results of some very interesting experiments on the rate at which different liquids flow through siphons. No two liquids flow at the same rate through siphons of the same dimensions—the periods required, for example, to draw off water, ether, bisulphide of carbon, and whisky of 914 deg. specific gravity, from a vial holding a little over four ounces, through a siphon of somewhat narrow quill tubing; being, respectively, seventy-four, forty-eight, forty-seven, and one hundred and eighty-two seconds. The same liquids flows at different rates through siphons of different diameters of bore, or of different lengths of limb, but the degree in which the rate of efflux through a siphon of given dimensions varies from the rate of efflux through a siphon of other dimensions, is far from being the same for all liquids. Mr. Galletly gives the results of three sets of experiments, in all of which the bottle employed was one capable of holding just 7,300 grains of water, and was four and a half inches deep, while the siphon used was a little over one-

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seventh of an inch in diameter of bore. In the first set of experiments the long limb of the siphon was eighteen and a half inches, in the second set of experiments nine inches and three-eighths, and in the third set of experiments only one quarter of an inch, longer than the short limb. The results of the three sets of experiments are embodied in the following table :—

Having so adjusted the lengths of the long limbs of siphons of different diameters as to cause them to empty a bottle of water in equal times, Mr. Galletly tried whether other liquids would also flow through them in equal times, and found that no other liquids would do so. He also experimented with long and short siphons, exactly alike in diameter of bore, and with the extremities of their limbs kept in each case at the same relative levels. The following table shows the results of two expements, the first with a siphon of which both limbs were about nineteen and a half inches long, and the second with a siphon of which both limbs were nine and a quarter inches long. Both siphons were of precisely the same diameter of bore, and in both experiments the extremity of the limb of the siphon placed outside the bottle,—which was the one already mentioned as holding 7,300 grains of water,—was kept just three-eighths of an inch lower than the extremity of the other limb.

Mr. Galletly concludes his paper with an example which suggests that their respective rates of efflux through siphons may be used to distinguish one liquid from another. He filled the bottle used in the experiments already quoted with paraffine oil of 797 deg. specific gravity (water=1,000), and found that drawing off this oil by means of the siphon used in the third of the three sets of experiments referred to in the first of the two tables given above, occupied 286 seconds. He then re-filled the bottle, this time with petroleum, of precisely the same specific gravity as the paraffine oil used in the preceding experiment, and found that for drawing off this petroleum by means of the same siphon 375 seconds were required. These facts point to the possibility of valuable practical tests of the purity, etc., of various liquids being based upon the phenomena to which Mr. Galletly has called attention. Is it not curious to consider how intensely individual the phenomena in question, together with those of spectrum-analyses, of the formation of cohesion-figures, etc., etc., show every substance in nature to be, in regard to every one, even the most seemingly insignificant, of its properties?

Steam Carriages in France.

"From the *Journal de Loir et Cher*, we learn," says the *Mechanics' Magazine*, "that a joint stock company has been formed at Blois for running stage coaches from that city to the principal towns in the department. The coaches are to be drawn by steam engines on the ordinary roads, according to the system of Mr. Lotz, an engineer residing at Nantes. The first coaches established will run between Blois, Romorantin, Selles sur Cher, St. Agnan, and Montrichard. Ten miles an hour, stoppages included, is the rate at which it is stated they will travel."

[These road locomotives will not run long. It is an old saying that one man may lead a horse to the water, but twenty can't make him drink. Engineers are able to construct machines to run by steam on common roads, but if the public won't patronize them, what is to be done? It is not a question of mechanical ingenuity, for that is already settled, but one of the popular taste, which no blatant arguments or hobby riding can overcome.—Eds.

Trades Represented in the English Army.

A return, recently issued, shows the number of non-commissioned officers and men in every regiment at home who have learned some trade before enlisting, and of the number who have worked at their trade since they entered the army. The largest number are shoemakers, of whom there were 3,279 enlisted, and 1,197 have practiced their trade since enlisting. The smiths are not far behind them, 2,732 of these having enlisted, and 1,083 afterward practiced their trade. It is a sign of the times that 2,756 weavers are among the enlisted men ; only three of them have practiced their trade since entering the army. There were also among them 2,151 tailors, 2,053 carpenters, 1,289 bakers, 984 painters, 973 masons, 855 butchers, 813 bricklayers, 556 gardeners, and 546 printers.

OYSTON'S STREAM-SPREADING NOZZLE.

This invention is designed to spread the stream of water issuing from the pipe of a line of hose, so that said stream would cover a larger area and be more efficient in extinguishing a conflagration than a straight jet; to effect this object the inventor constructs a cup shaped vessel, A, which is attached to the end of a nozzle, said vessel having a number of levers jointed at the middle, and so operated by the revolving cap, C, that they assume different positions, affecting the nature of the stream issuing from the mouth of the vessel, so as to change the character of it with each alteration in the position of the levers. These levers can be thrown entirely clear of the stream as shown by the dotted lines, so that a straight

jet will be projected; or by partially rotating the cap C, four of the levers will be first thrown in toward the center as at, D, and by continuing the rotation the other four will be forced entirely in so that all radiate from a common center, thus changing the stream issuing from the nozzle into a mist or spray which is said by the inventor to be more effectual in extinguishing fires than a solid column.

The figure holding the pipe and the several streams shown issuing therefrom explain the idea of the inventor very clearly.

The above article may be seen at the office of Cornish & Congden, 179 Broadway, up stairs, New York. A public exhibition of it will be given in this city in a few days, of which notice will be given in the daily papers. The inventor desires to call the attention of insurance Companies and all persons interested in saving property from fire to this improved pipe, which was patented through Scientific American Patent Agency, on Aug 25th, 1863, by Charles Oyston of Little Falls N. Y. for further information address him as above.

Castor-oil beans are said to be a most profitable crop to grow, being worth at the present time $2 50 per bushel, with small prospect of a decline.

Experience with Bessemer Metal.

We make the following extracts from an editorial in the London *Engineer*, of March 31st;—

RAILROAD RAILS.

We are in a position to give some particulars as to the results already attained in the use of Bessemer metal for rails, ships' plates, etc., and these, it will be seen, are such as to leave no doubt of the vast importance of this material for the purposes of the engineer and constructor. In the year 1861 the London and North-Western Railway Company purchased 500 tuns of rail blooms from Messrs. Bessemer and Co., and when rolled into rails one of these, taken at random, was put down in a part of the line near Camden Town, where the traffic was unusually heavy. The wear of the contiguous iron rails and that of the steel rail was carefully noted by order of the Board of Directors. On the application, in 1864, of a gentleman interested in the subject, the following particulars were kindly furnished him:—The rail was laid down May 9th, 1862, and when examined in September, 1864, "there were little signs of wear." 8,000 goods trucks pass over this rail in twenty-four hours, and it is estimated that 7,000,000 trucks passed over it in the two years and four months covered by the report. The neighboring iron rail, also put down new on the 9th of May, 1862, was turned in July; new rail September 9th, 1862, turned November 6th; new rail January 6th, 1863, turned March 1st; new rail April 29th, turned July 3rd; new rail September 29th, turned December 16th; new rail February 16th, 1864, turned April 12th; new rail August 6th, still down at the date of the report. So the Bessemer rail had nearly worn out both sides of seven rails. The steel rail, it is since understood, is still in use, in good condition, and without having been turned. Here if ordinary rails are worth £7 per tun, the Bessemer rail would be worth very much more than £50. The traffic through the Crewe station is, it is well known, very great. Formerly the iron rails were worn out there in four months, each side of the rail giving two months' wear. The station was laid throughout, November 10th, 1861, with steel rails rolled by the company from ingots made by Messrs. Bessemer and Co. None of these rails have yet been turned, and it is understood that they appear likely to go two years more before even the first face is worn out. Here the comparison with iron would appear to be something like twenty or more to one.

SHIPS' PLATES.

In the case of ships' plates, Messrs. Jones, Quiggin & Co., of Liverpool, employed Bessemer cast-steel almost exclusively in their ships built in 1864, and they have used large quantities of it since 1860. This firm last year launched twelve sailing ships and eleven steamers, the frames of which were of puddled steel and the plates of Bessemer cast-steel. The plates are, on the average, five-eighths as heavy as iron used in like veseels, the saving in weight being, of course, added to the useful burden of the vessel on a given draught. Among the steamers will be recognised the names of the well-known blockade runners :—the *Colonel Lamb* and *Hope*, each 281ft. long, with 350-horse engines; the *Rasine* and *Raiby*, 260ft. long, with 300-horse engines; the *Cora Bellt*, *Wasp* and *Hornet*, each 250ft. long, with 220-horse engines; and the *Lynx*, *Fox*, *Bat* and *Owl*, varying from 532 to 771 tuns.

FINE TOOLS.

Messrs. Benjamin Hick & Sons, of Bolton, employed Bessemer tool steel in their works for some years, and, we believe, are still using it of their own make —they having become licensees some time since.

RAILWAY TIRES.

Railway tires thus far made of Bessemer metal have not, heretofore, been generally made out of a solid block, but in a bar or bars, afterwards welded together. There is no cast-steel tire whatever that can be depended upon if completed by welding, and several Bessemer tires thus made have failed in the weld. Among these were a considerable number of engine tires supplied to the London and South-Western Railway. But the fault was not that of the material, and we feel no risk in saying that Krupp's tires, excellent as they unquestionably are, would, had they been welded, have failed in the same manner. Krupp's tires are made from a solid block of oblong shape, and through which a slot is made by drilling and cutting, this slot being afterwards opened out so as to

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form the metal into a hoop, which is finished by heating and rolling. Arrangements are being made for making Bessemer tires in the same manner, and it is not unlikely that, the risk of broken welds being thus removed, they will take the place of all tires now in use.

PLATE GIRDERS.

We believe some small plate girders of Bessemer steel have been constructed, but its advantages would appear chiefly in large spans, where, in the case of iron, the weight of the bridge itself forms the greater part of its own load. For ordinary spans the present price of Bessemer steel leaves no margin of advantage to the engineer. It is known, however, that it is being learned how to turn the commoner kinds of English iron to good account in the Bessemer process, and as the waste in manufacture is very little and as a great number of firms are now competing in the business, it is in all respects probable that Bessemer metal will fall rapidly in price, and that its use will be as rapidly extended.

OUR SPECIAL CORRESPONDENCE.

The center of the cotton manufacture. Enormous profits of the business. Prosperity during the war. Curious effects on the business of our inflated currency. Work being resumed. Prosperity of other manufactures.

PROVIDENCE, April 22, 1865.

MESSRS. EDITORS:—This is the center of the manufacturing interest of New England. On the beautiful hights in the eastern part of the city are noble residences of the Spragues, the Browns, the Iveses, and many others whose villages are scattered along the valleys of this and the adjoining States, and who have made collossal fortunes by spinning, weaving, bleaching, or printing the white ala of the *gossypium herbaceum*, and thus fitting it for clothing the backs and limbs of men and women.

One establishment that I happen to known about, which has a capital of $200,000, made last year a gross profit of $97,000, and after reserving $27,000, they divide $60,000, which is a net profit of 30 per cent. This is, however, better than the average for the last year, as the decline in cotton from $1 80 to 25 cents per pound has in some cases swallowed up the whole, and in others, a large portion of the profits. But the cotton manufacture has never known a a more prosperous period than during this war.

I was very much interested in the details of the embarrassment to this industry, as to all others, from the fluctuations resulting from our inflated currency. A large manufacturer was asked the present cost of making a yard of 60×64 print cloths, besides the cost of the cotton. He replied about 3 cents, just double the cost under the old specie currency. He explained that wages are about 50 per cent higher, coal, freights and supplies generally about double, carrying the cost up to about 2½ cents, and the remaining half cent is caused by the uncertainties and fluctuations in the business. For instance, two months ago he decided from the rapid fall in cotton to stop buying, and to work up all he had on hand; consequently the beams were filled first with 30 yards of yarn, then with 20 yards, and then with 15 yards, thus making the expense of "drawing in" the same for half a piece as for a whole piece when the mill was running full time. Furthermore, the expense of superintendence, clerk hire and many other departments is no more with a full product than with half product. In short, there are innumerable ways in which the uncertainties and embarrassments resulting from a fluctuating currency operate to diminish the production of wealth, in this, and in all other branches of the national industry.

The present comparatively low price of cotton has produced a common feeling that it will not probably fall much more at present, and a good many mills that have been suspended are resuming operations. There is a general feeling, however, that it is very much of a speculative, gambling transaction, rather than a safe, steady and substantial business.

The iron, steam engine, machine making, and other manufactures generally are very profitable, and the city is accumulating wealth with great rapidity. I have just been through one of the large manufactories of cheap jewelry, but will reserve an account of that for my next communication. B.

Correspondence

Northern Cotton.

MESSRS. EDITORS:—By an act of Congress, public attention has been attracted to the mode of preparing flax and hemp as a substitute for cotton. Those engaged in the experiment of these fibers are sanguine of success. Owing to the scarcity of the staple resulting from the war, the culture of cotton has been attempted in the States of Kansas and Missouri, and other States as far north as the 40th degree of north latitude, which seems to be the northern boundary of King Cotton, beyond which Nature has forbidden his jurisdiction on the American continent. This parallel appears to be also the southern boundary prescribed by nature in America for the growth of a plant which has many, if not all, of the characteristics of the cotton plant, viz., *Epilobium*, and which, according to the books, is indigenous as far south as Pennsylvania, and as far north as the arctic circle.

In the month of October last I collected a small quantity of the plants of the common fire-weed. The plant proved to be Epilobium, and in compliance with a request of the Agricultural Department at Washington, I have made certain experiments which it may be interesting to your readers and to the public to have submitted to them.

My first utilization of the fiber was the simple operation of picking it from the pod in which it grew, and placing it in the tube of a common oil lamp—forming a wick by twisting it with my fingers; it answers every purpose of wicking for which we have been paying from seven to ten dollars per pound.

Encouraged by this success, I resolved to ascertain whether it would spin, and the result was a stocking, which was carded, spun, knit and dyed by the same tiny hand that picked the fiber from the pod in which it grew. Next I had made a flat wick for the rotary burner used in kerosene lamps, which was equally successful in its operation; then a braided wick for a sperm candle, and a common strand wick for a tallow candle. For the purpose of testing the strength of the fiber, I took the braided wick to a shop, and lifted first a seven, then a fourteen pound weight, and then both together, without any symptoms of breaking. Furthermore, I had made a cord, about the size of a common clothes-line, which did not break till I put two fifty-pound weights upon it. The wicking was saturated with sperm oil; the cord was not saturated, but entirely dry, and twisted by hand, after the fiber had been spun into strands, on an old-fashioned large spinning wheel. The fiber was carded by hand, on cards of number 32 wire. Mixed with one-fourth wool or cotton fiber, the yarn can hardly be distinguished from woolen or cotton yarn, but I have not enough of the material to weave it, and of course know nothing upon that branch of the case. The woman who spun it said that it was much better than yarn she had worked in a cotton factory. A manufacturer of under-shirts and drawers (mixed half and half) has promised to try it next fall.

That it will make wadding, batting, etc., is conceded by the manufacturers of those articles, and an extensive paper manufacturer pronounced it the best material (except silk) he ever saw for fine paper. The fiber measures from three to six-eighths of an inch in length; the former grew on dry, sandy loam, the latter on moist ground near a spring of water.

Dr. Copman, of Utica, who is considered a very cautious observer, certifies, after careful examination and comparison under his glass, that the fiber of the Epilobium has all the characteristics of the cotton fiber, and is a very different substance from the fiber of the milk-weed, which was compared at the same time with both the cotton and Epilobium fiber.

RUTGER B. MILLER.

Utica, April 4, 1865.

Petroleum in Chemung Valley.

MESSRS. EDITORS:—I am a reader of your valuable paper, and among the quantities of good reading I occasionally see an article on petroleum oil, and I write this letter to communicate something upon that subject. We have discovered petroleum in the Chemung Valley. It has been found all along the Chemung Canal, and in the Valley clear to the head of Seneca Lake. I myself have skimmed quantities of it off the water, and will send you a sample if you would like to see it. Others have done the same thing, and the people of Havana and Watkins are now in a blaze of excitement upon the subject. The oil is of the best quality, as many will tell you who have gathered bottles of it. The existence of the oil has only lately become generally known, but last week it was discovered oozing out of the ground in large quantities in different places. Some geologists and chemists have examined it, and say the whole valley is filled with oil. I send you this letter thinking the information may be worth publishing in your valuable journal, of which I am a constant reader. W. J. CRANDELL.

Millport, April 24, 1865.

Saleratus and the Teeth.

MESSRS. EDITORS:—In the last number of the SCIENTIFIC AMERICAN I notice an extract from the correspondence of the *Dental Quarterly* in regard to the effects of saleratus and cream of tartar upon the teeth. The publication of such ideas as we find expressed therein for a long time, in all kinds of journals, has resulted in disseminating among the people erroneous ideas in regard to their teeth, and has increased the labor of dentists exceedingly, thus showing their baneful effects. If the people generally had clear ideas of the simple nature of decay of their teeth, the trouble and expense of keeping them in good condition would be exceedingly lessened. Hence one who understands why teeth go to ruin and cause so much misery in life must feel as if the short extract in question must go still futher to mystify the public. This simple subject should have one thorough ventilation in the public journals to solve the difficulties and wonders of many minds in this respect, and set the people to thinking rightly, instead of catching up here and there little absurd notions, which only have the effect to mislead and injure them.

The enlightened labors of Dr. Amos Westcott, one of our leading dentists, have settled to a certainty the cause of caries of the teeth, and his experiments have been so thoroughly conducted and so generally recorded in standard works on dentistry, that if any dentist has of late felt that there is a mystery about the decay of teeth, he shows that he cannot have studied any standard work in dentistry, and hence is unfit to advise the public in dental matters. Saleratus is an alkali, and cream of tartar is an acid, and the correspondent says:—"Saleratus removes the gelatine, the cream of tartar removes the lime—the two principal ingredients of the teeth—and between the two evils the teeth stand a poor chance, and hence the result." The experiment of the correspondent conflicts with Dr. Westcott's experiment with saleratus and teeth, for on page 286 of Harris's "Principles and Practice of Dental Surgery," the main work extant in dentistry, we find among the results of Dr. Westcott's experiments the following recorded:—"Alkalies do not act upon the enamel of teeth; the caustic potash acts readily upon the bone of the teeth by uniting with its animal matter." Why? Because in the enamel less than one in one hundred parts consists of animal matter, while in the bone twenty-eight parts in one hundred are gelatine and water. In the enamel ninety-nine parts consist of lime, magnesia and soda. Although the two results are differently recorded, we must give preference to that of Dr. Westcott, for it has the stamp of authority and consistency and relative facts, which show great sagacity and education, while all we have to do to demonstrate the lack of penetration and information of the Portsmouth correspondent is to consider what has escaped his notice, although I dare say any woman could have told it to him, viz., that of all this 32 tuns of saleratus and cream of tartar dispensed to the 10,000 people of Portsmouth in a year, to the ruin of their teeth, not one ounce ever came in contact with a sane person's teeth until after the two articles had been combined in cooking so as to form tartrate of potash, a neutral salt, or the bitartrate and carbonic acid gas, which are two totally different articles from either cream of tartar or saleratus, and absolutely harmless to the teeth practically. Suffice it to say that the only cause of the decay of the teeth is contact with acids, which arise either by the taking

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of one into the mouth, or by decomposition of food left in small portions between the teeth, where it finds three things eminently conducive to its decay, viz., warmth, moisture, and oxygen from the air. This would be prevented by an alkaline state of the saliva, but that condition is found only in those cases where a person enjoys the most perfect health constantly. Pardon me for sending you so long a communication; but these things seem so little understood by the public generally that some degree of minuteness appears called for. C. A. N.

New York, April 24, 1865.

Incubation.

MESSRS. EDITORS:—Can you inform me what the amount of heat used in incubation is, and if it is the same for the whole three weeks. I have made some experiments to find out myself, but none were satisfactory. H. H.

Woburn, Mass., April 15, 1865.

[The proper heat for the hatching of hens' eggs, is 104° of Fah., to which degree the surface of the body of the hen will raise the thermometer when she sits upon her eggs. In those birds that do not sit constantly, but trust to the heat of the sun, the temperature of the eggs is probably below 104°.

The full period of incubation by the hen, in this country, is well known to be twenty-one days. In warmer climates it is said to be a day or two less. The periods of incubation vary much in different species of birds; we introduce the following table, which has been compiled from different authors by Count Morozzo, in a letter from him to Lacepede, to show the periods of incubation compared with those of the life of certain birds.

Names of Birds.	Periods of their Incubation. Days.	Duration of theis Life. Years.
Swan	42	about 200
Parrot	40	about 100
Goose	30	80 or more.
Eagle	30	
Bustard	30	Period of life
Duck	30	not known.
Turkey	30	
Peacock	26 to 27	25 to 28
Pheasant	20 to 25	18 to 20
Crow	20	100 or more.
Nightingale	19 to 20	17 to 18
Hen	18 to 19	16 to 18
Pigeon	17 to 18	16 to 17
Linnet	14	13 to 14
Canary	13 to 14	13 to 14
Goldfinch	13 to 14	18 to 20

Crane and heron, as well as ostrich, hatch their eggs chiefly by the heat of the sun.—EDS.

Thin Steel Wanted.

MESSRS. EDITORS:—Being engaged in working on smut machines, I have observed that the zinc we use for screens, no matter how well put on, seems to be so much affected by the weather that the surface gets very uneven, and the wheat cannot spread evenly over it. I was thinking, from seeing several interesting articles in your valuable paper about rolling steel thin, that if we could get steel about 36 on the wire gage, not to cost a great deal more than zinc, it would answer a better purpose, be more durable, and keep a better surface. Would you be kind enough to let me know the names of any parties that make steel such as would answer, and oblige.

R. A.

Chicago, April 4, 1865.

[The plate for the steel letter was rolled at the Sligo Iron Works, Pittsburgh, Pa.—EDS.

To Preserve Maple Sirup.

MESSRS. EDITORS:—The SCIENTIFIC AMERICAN of April 8 has a plan for keeping maple sirup to retain its delicious flavor, which is to nearly fill bottles and put cotton in the mouths of them. "to allow the gases of fermentation to escape." Maple sirup to be fit for anything but vinegar or rum must not ferment in the least. It may be kept the year round just as good as when made by filling bottles or stone jugs with the hot sirup, leaving just room for the corks, and sealing them with wax. We have kept it thus for several years past, and ask for no better plan.

Red Bank, Ohio. P. F.

[The best way to have maple sirup pure is to buy good sugar and melt it down as required. It is more economical in this way, for the consumer does not pay for water and other matters which the sirup holds. There is no risk or trouble whatever, either with bottles or any other vessels.—EDS.

The Laws of Falling Bodies.

MESSRS. EDITORS:—Several questions having arisen in regard to the force of falling bodies, between some parties here, I am requested to write to you and get your opinion in regard to the matter.

The first is, "Will a ball shot from a rifle into the air, perpendicularly, have the same velocity, and consequently the same force, when it returns to the earth that it had when it left the gun?" In practice, common pigeon shot, being discharged into the air, fall back harmlessly to the earth, although they leave the gun with force enough to kill one. This fact does not harmonize with the law, that the velocity of a descending body is the same in its ascent as in its descent. Why do not shot have the same force in falling as in ascending.

Second, "Will not a ball of candle wicking, weighing 1 lb., fall 100 or 1,000 feet in exactly the same space of time as a ball of lead of equal weight?"

Third, "Will not all bodies of the same material and same shape fall alike to the earth in the same space of time, notwithstanding one may be three times as heavy as the other?"

These questions all suppose the experiments to be done in the air with the atmosphere as it is, and not in a vacuum. I myself can understand the solution of these questions, but I cannot answer the question "why shot do not have the same force in falling they have in ascending." My answer is, they will when they have acquired the same velocity in falling they had at the moment of leaving the gun. We know they do not have that velocity, but yet the answer is "that the velocity acquired during the fall is equal to the velocity of projection."

WM. SPALDING.

Derby Line, Vt., April 19, 1865.

[The resistance of the air causes the shot to fall with a velocity less than that of their ascent. A ball of candle wicking will fall with the same velocity as a ball of lead in a vacuum, but not in the air. In a vacuum the size of a body has no influence on the rate of its descent, but in the air the larger the ball of any material the more rapid is its fall.—EDS.

New Discovery of the Breeding of Sex.

[For the Scientific American.]

A knowledge of the cause of the difference of sexes in the animal kingdom is a means of breeding whichever sex may be preferred.

For several years I have been in possession of this knowledge, and being a Frenchman, I had intended to communicate it to the Academy of Sciences at Paris; but illness has prevented my return to France. Fearing that my secret may perish with me, as in the case of Segato, I have decided to publish it for the benefit of all civilized people.

Experience has shown that the theory heretofore prevailing in regard to the production of the sexes is false, and that this which I submit is the only true one.

It is the male who engenders the substance destined already to be of the masculine sex or the feminine before the female receives it. The right apparatus engenders the male, the left the female. By operating a partial castration, therefore, of the male, it is easy for stock breeders to procure offspring all of either sex.

At La Hotte, near Fort Liberty, in Hayti, this process has been in operation for several years, and for the twelve years that I have watched the result it has never failed.

A. DE FERRANDI.

Mahan's Field Fortification.

Messrs. John Wiley & Son, 535 Broadway, New York, have published a new edition of the treatise on Field Fortification, by D. H. Mahan, L.L.D., Professor of Civil Engineering in the United States Military Academy. It is a work of 284 pages, and is designed as a text book for the numerous private military schools that are springing up all over the country. We extract the following definitions:

The term *Intrenchments* or *Lines* is applied to fortifications of considerable extent, thrown up to cover an entire army or an army corps on the front and flanks. A position so fortified is said to be *Intrenched*.

The term *Field Work* is applied to a fortification of limited extent, to be occupied by a small isolated detachment dependent upon its own means of resistance.

Fortifications should be regarded only as accessory defensive means, but still a very important one, and they will conduce to the end proposed the more nearly they are made to satisfy the foregoing conditions of a strong defensive position.

To satisfy the first three of these conditions, viz.: to offer an obstruction to a hand-to-hand conflict; to shelter the assailed from the view and fire of the assailant; and to afford the assailed a commanding view and a sweeping fire over the assailant's lines of approach; fortifications must consist of a covering mass of earth, stone, wood, or iron, of sufficient height and thickness to screen the men behind it from view, and to intercept the missiles of the assailed, and of some obstruction in advance of it which will prove a serious obstacle in the way of the assailant's advance.

Parapet.—The covering mass is termed a *parapet* when it fulfils the last two of these conditions; when intended simply as a screen, as in the case of a cover for cavalry when waiting to be brought into action, it is termed an *epaulment;* and when used to cover troops from an enfilading fire on the flank or in the rear, a *traverse.*

Ditch.—The most usual obstruction to impede the enemy's advance to attack with the bayonet, is a *ditch* placed in front of the parapet. When the parapet is of earth, the ditch furnishes the material for its construction.

Banquette.—When the parapet is too high to admit of a man standing on the natural level of the ground to fire over it, a platform of earth or wood is placed behind it, from which the soldier can fire at the proper level. This is termed a *banquette.*

Banquette Slope.—When the top surface of this platform, termed the *banquette tread,* is too high to be reached from the ground by an ordinary step, a ramp, either of earth or timber, is placed in rear of it, by which it is reached. This ramp is the *banquette slope.*

Interior slope.—The interior face of the parapet, when arranged for musketry, is termed the *breast hight,* or *interior slope;* when for artillery the *genouillère.*

Superior slope.—The top of the parapet is the *superior slope.*

Exterior slope.—The exterior face is termed the *exterior slope.*

Berm.—Between the parapet and ditch a narrow zone is usually left on the natural surface of the ground which is termed the *berm.*

Scarp and Counterscarp.—The side of the ditch adjacent to the parapet is termed the *scarp;* the side opposite to this, the *counterscarp.*

Glacis.—A mound of earth placed in front of the counterscarp with a gentle slope outwards is termed a *glacis.*

Trench.—To obtain speedy cover, the parapet is formed from a ditch within, termed a *trench,* of sufficient depth, with the height of the parapet, to give shelter to the troops when standing in the trench. The natural ground serves as the banquette tread in this case.

A NEW invention for working ships' pumps by the capstan in case of fire, for which a patent has been registered by Mr. Matthew Blank, engineer, was tried on the 6th ult. on board the *Irresistible*, in Southampton-water. Sixty revolutions were obtained with one man to each bar of the capstan, and 73 with two men to each bar; while 100 men would, as we are informed, be required, under ordinary circumstances, to get 70 revolutions. The trial was successful, and the invention was pronounced very valuable. Extra hands were put to the capstan to force a column of water to the upper deck. This pressure was hardly fair to the inventor, but, notwithstanding the immense force applied, nothing gave way.—*London Artizan.*

MR. CAILLET has pointed out to the Academy of Sciences that cast-iron loses carbon when kept for a considerable period at a heat somewhat below its point of fusion, and suggests that this fact might be turned to practical account. He finds that "blades of iron, heated among clean borings of cast iron, become cemented and form excellent steel," while "blades heated in the same furnace, but not in contact with the cast iron, are not cemented." He adds that the cast iron is not at all deteriorated by the process.

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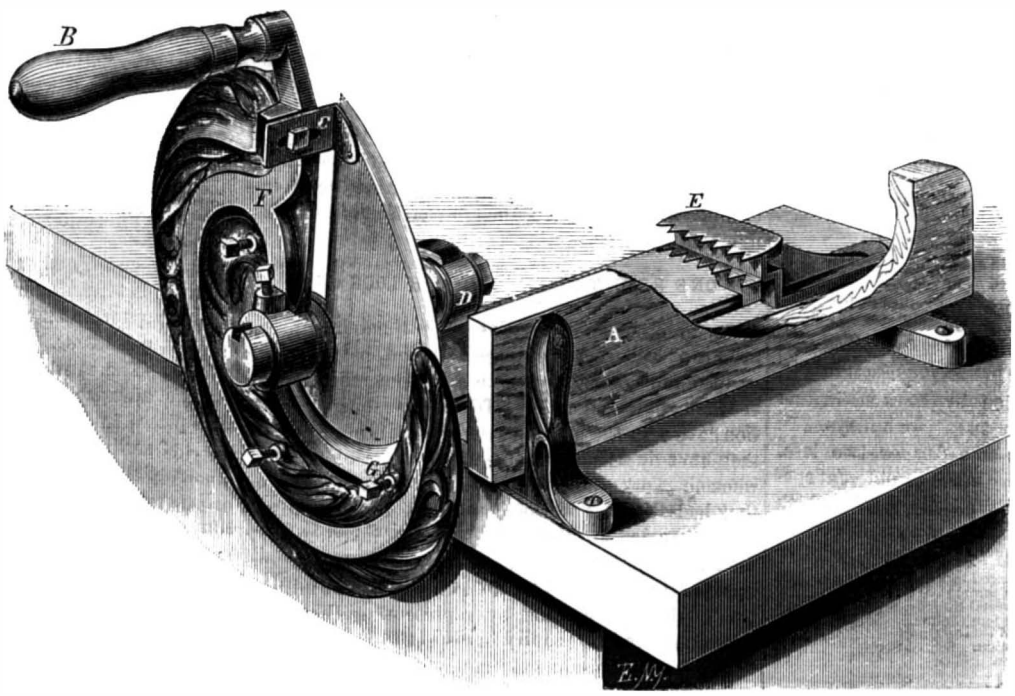
Improved Bread Slicer.

There has been a great demand of late years, especially since the war, for a convenient and simple machine to slice bread and meat with. The inventor of the one herewith illustrated says that his object has been to combine utility, neatness and durability at a moderate cost, and he thinks the end is obtained in his machine.

It is self-feeding, and by merely placing the loaf or joint of meat to be cut in the feed box, A, on turning the handle, B, the knife is revolved against the food and a slice is removed. The knife works close to the edge of the board, and can be adjusted at any time by the screws, C, in the handle. The loaf is fed up to the knife through the agency of a leather belt, D, which passes over rollers not seen; the end being attached to the clamp, E, which presses the work forward and holds it down at the same time.

In the guard, F, which protects the knife there are several cutters provided with bolts, G, which score the food to be cut in a vertical direction, so that strips may be removed instead of slices; the knife acts in conjunction with these. Any desired thickness of slice or shred can be cut by properly adjusting the feeding mechanism, and for cutting cabbage, bread, boneless meats, etc., it will be found useful. It was patented Jan., 3d, 1865, by G. B. Pullinger. For further information address J. H. Beardsley, 119 Nassau street, New York.



PULLINGER'S BREAD SLICER.

Improved Longitudinal Time Fuse.

Great difficulty is experienced in lighting the time fuses on the front ends of shells, particularly those used in rifled guns having soft cups or rings, to cut off windage, or impart rotary motion to the projectile; in these the flame from the charge is stopped too suddenly to reach the fuse. This imperfection is remedied in the shell shown herewith. This time fuse—graduated and cut like the Boreman fuse—is located in a longitudinal groove or grooves in the periphery of the shell, commencing near its base in front of the gas cup, and extending forward, entering the chamber of the shell nearer its front. Its position thus greatly increases the chances of ignition, whilst its construction is exceedingly simple as can readily be seen. Mr. Wright, the inventor of this shell is also the inventor of the ring fuse, and the cap machines which have supplied our armies since the rebellion, some sixteen machines being in operation, each capable of making fifty thousand a day. This fuse was patented March 21, 1865; for further information address. Geo. Wright, care of S. S. Fahnestock, Washington City, D. C.

Fig. 1

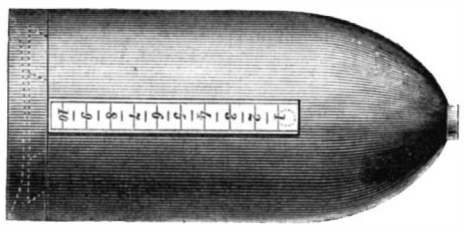
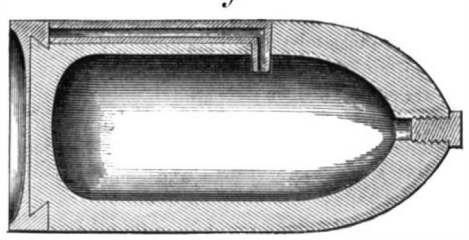


Fig. 2



WRIGHT'S LONGITUDINAL TIME FUSE.

New English Water Motor.

A rotary engine which, if it should utilise the percentage of power claimed for it by the gentleman who designed it, Mr. C. H. L. Fitzwilliams, is likely to be very largely adopted where small power is occasionally required, was described at a recent meeting of the Institute of Engineers in Scotland.

Practically, the engine may be regarded as two drums united to form one large cylinder, within which there work two pistons, each formed by uniting the halves of cylinders of different diameters, and easing down the asperities. Each piston rotates upon a shaft, which passes through the center of the drum, and as the pistons are connected by toothed wheels outside the cylinder, so that the large sides shall always be parallel to each other, it will be obvious that in each drum a water channel is alternately formed and closed between the piston and the side of the cylinder, the pressure of water in the supply-pipe acting upon the portion of the piston which connects the peripheries of the two halves. Mr. Fitzwilliams considers that if the fall is not more than 30 feet it cannot matter much where the engine is placed with regard to it; it would be just as efficient placed at the top as at the bottom of the fall. The water moves through the engine in one solid stream, during one-half of the revolution down one side, and during the other half down the other.

A comparatively small surface of the water comes in contact with the sides of the engine, so that the friction cannot be great between either the water and the engine itself, or between the different molecules of the water. The invention is likewise applicable as a water-meter, and as a pump, for which latter use it is claimed to be superior to the ordinary centrifugal pump, as it can work at quick or slow speeds with equal efficiency.

An interesting discussion followed the reading of the paper, Prof. Rankine, Mr. J. M. Gale, Mr. Downie, Mr. J. Elder, Mr. Yule, Dr. Joule, Mr. Day, and Mr. Fitzwilliams, taking part; and the general opinion seemed to be that it could not be used as a motive power economically, but that as a water meter it could be advantageously employed.

TRAINING DOGS.—In the course of some conversation in relation to dogs, Governor Anderson, of Ohio, related a Texan practice in training dogs with sheep. A pup is taken from its mother before its eyes are opened, and put with a ewe to suckle. After a few times the ewe becomes reconciled to the pup, which follows her like a lamb, grows up among and remains with the flock, and no wolf, man, or strange dog can come near the sheep, and the dog will bring the flock to the fold regularly at 7½ o'clock, if you habitually feed him at that hour.

New Metallic Alloys.

Messrs. T. Dunlevie and John Jones of England have patented a metallic alloy, to be employed for the bearings of shafts or frictional surfaces in machinery. The improvements consist in the combination and use of spelter and block tin, to which is added a small quantity of copper and a small amount of antimony, and the mode of combining the above in the melting pot is as follows:—First, take 4 ozs. of copper, melting or fusing it in any ordinary crucible.—When fused, add 16 ozs. of block tin and 1 oz. of antimony; and when the whole are melted together, pour the compound out into a mold. Then melt in a separate vessel 128 ozs. of spelter, together with 96 ozs. of block tin, and when both are fused, add the above ingot of copper, tin, and antimony, and fuse altogether; when properly fused in these proportions, or thereabouts, the alloy is complete. The chief features of this alloy are of great durability, and its low temperature when under the heating influence of friction.

For lining bearings, journals, etc., the bearing is to be tinned, in the ordinary method, with block tin and salammoniac. The improved lining alloy is then gradually fused, and the bearing heated, until it will fuse a solid strip of the alloy. A heated shaft, or mandril, is then inclosed in the bearing and mold, and the alloy poured in between the bearing and the shaft, remaining until it hardens; the bearing is then taken from the mold lined with the alloy.

JEFF DAVIS AND HIS 16 TUNS OF GOLD.

The flying ex-President of the ex-Confederacy is reported to be on his way to Mexico with a sum in gold variously estimated from six to thirteen millions of dollars—being the proceeds and net avails of the contents of all the banks he could get at during the closing hours of his career. The probability of its safe transport is much lessened when we reflect upon the enormous weight of it. We read, in a familiar verse of "John Gilpin:"—

> He carries weight, he rides a race
> 'Tis for a thousand pounds!

In like manner Davis carries—estimating his plunder at $10,000,000, net—the enormous weight of 16 tuns—one million of dollars weighing 3,700 lbs. Considering the condition of Southern roads and the endurance of wagons and horse-flesh, it is unlikely that the treasure will ever be carried off safely, and we hope ere long to chronicle its capture.

Mechanical Improvements.

There have recently been introduced in the Fort Pitt Works two very important mechanical improvements, the first a new plan for turning trunnions, and the second for casting shells. Heretofore, the shoulders about the trunnions have had to be shipped off by hand, a slow and laborious plan, but by the employment of another eccentric cam applied to the lathe, this portion of the gun, like all the rest, can now be turned. This great improvement has been made by Mr. Kaylor, an employee of the works. The second improvement, in the making of shells, is in casting them with five-inch sinking heads, which are subsequently turned off, instead of the small heads formerly made, by which great density of metal is obtained.

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VOL. XII. NO. 19...| NEW SERIES. |....*Twentieth Year.*

NEW YORK, SATURDAY, MAY 6, 1865.

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(Illustrations are indicated by an asterisk.)

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BESSEMER STEEL IN THIS COUNTRY.

The old steamboats which ran upon the North River in the palmy days when a sail up that glorious water course was like a chapter out of a poem, present many features which, to the curious and those who love to compare present progress in the arts with past, are interesting in the highest degree. Wide of beam, long in the keel, with huge paddle boxes overtopping the frail hulls they looked more like some absurd and unnatural relic of the antediluvian period than modern vessels intended for the transportation of passengers.

The machinery of the steamers was not more remarkable than the hulls; and those details, which are now usually forged, were cast or constructed of such materials as the workmen in that day were able to manage. Thus one steamer—and doubtless others—had huge shafts of boiler iron; they were six feet in diameter, adequately stayed and strengthened, and were adopted partly in order to solve the question of fitness between them and cast iron, and partly because forges to construct and lathes able to take in wrought iron or cast-iron shafts of the proper dimensions were unknown in the country. Since the period which marked the introduction of these boats and the adoption of their boiler iron shafts, the world has made great strides in the mechanic arts, and there are but few exigencies liable to arise wherein the remedy is not at hand.

The increased facility with which wrought iron can be worked and its adaptation to obvious purposes have rendered it almost indispensable. Iron in its three principal forms is the chief substance on which we rely for strength and durability, and since wrought iron has a higher tensile strength than cast, and steel a greater than either, it is obviously the material to be used where it can safely be to the exclusion of other.

The expense, however, has been one of the greatest barriers to general use, and its introduction in machinery has only been possible where large sums have been paid for work and makers instructed to spare no pains to make their work first class.

But by the success of the Bessemer process, and its practical adaptation to the production of steel in large masses of superior quality, the mechanic arts have received a wonderful impulse in all that relates to the durability of the machinery by which they are prosecuted.

The expense of repairs and renewal of railway stock, which are the chief items of outlay, involving often the sacrifice of dividends, and causing grief to stockholders, the breakage of costly shafts on steamships, the great advantages from dispensing with the transportation of non-paying weight and the perfect integrity of the material throughout, are reasons for advocating its adoption in place of wrought iron. English shipbuilders have used quantities of this metal in past years and the saving in weight above alluded to is very great—in iron vessels five-eighths of the thickness being used in place of iron; and we have no doubt but that our own mechanics will avail themselves of it at an early date. We have said enough in this artice to show a few of the uses to which it may be put, and we shall doubtless mark a new period in the dimensions and weight of machinery. Messrs. Corning, Winslow & Holley, who have introduced the process in this country, are now prepared to manufacture it, and we direct the attention of all interested to their advertisament in this number.

ONE RESULT OF THE ENGLISH LOCK-OUT.

The great strike of the English iron manufactures, or *masters*, as they are termed abroad, has been described and commented on in a previous number of the SCIENTIFIC AMERICAN. To those persons who may not have seen the account referred to it is necessary to state that by reason of some men in a certain locality refusing work the masters took concert in action and declared their works closed until the operatives should return to their labor. The injustice and meanness of this act needs no comment, and it now appears that agents went abroad on the first intimation of the troubles and by representing the great advantages of this country in respect to political privileges, wages, permanent employment, and kindred matters, succeeded in inducing large numbers of operatives to embark, and many of them have already arrived.

So far as regards permanent employment and the want of workmen there can be no question as to the expediency of coming to this country, but between the days when the arts of peace shall supplant those of war and the disorder which now exists in society at the South, there must invariably be a period of relaxation when trade will be dull and times hard. From the tremendous strife and struggle in which we have been engaged we must take breath for the sober business which is to follow.

Already the Government is discharging the superfluous hands from its armories and navy yards. The contracts for iron-clads have been completed, and while there is work enough in store for all there will be a period of dullness, as we have remarked, which must of necessity ensue. We therefore warn our mechanics to be provident now when wages are high and prepare for the future, and if English workmen see fit to come here they should not come with empty pockets or expect to find employers coming off in small boats to take them from the ships before they land.

When the war first broke out, four years ago, there was a greater demand for workmen than there now is and emigration of artisans to this country at this juncture will result in overstocking the market so that wages will be very low.

WHO INVENTED ILLUMINATING GAS?

The last number of *Le Gaz* has a report of a lecture by M. Payen on lighting by gas, delivered at the Sarbonne before a brilliant audience of scientific men and men of the world. The first part of the lecture was devoted to a historical sketch of artificial lighting. After tracing the use of candles and oil, M. Payen said:—

"The invention of lighting and heating by gas is due to Philip Lebon. The priority of this discovery was acquired (*acquise*) by a patent dated 1798, and by the memoir more explicit which he presented the following year to the Academy of Sciences. This able engineer understood at that time all the scope of his bold conception; in his enthusiasm he said to his fellow citizens, "My friends, I shall be able to send you continually from Paris to Brachay by artificial light and heat." The peasants who heard him shrugged their shoulders and remarked, "He is crazy!"

M. Payen speaks of Murdoch having lighted the shops of Watt and Bolton with gas in 1792, but still awards the priority of the discovery to Lebon from the statements in his memoir.

PRIZES AT EXHIBITIONS.

On another page we publish a list of thirty-two prizes offered by the Industrial Society of Amiens, in France, and they will doubtless offer suggestions to our own people, not only to the managers of fairs and exhibitions, but also to manufacturers and others who may desire to call out some particular invention or information in connection with any part of their business. It will be observed that a manufacturer of velvet offers a prize of twenty dollars, in addition to the gold medal of the Society, for an improved dressing for his fabrics, and several other prizes are increased in value by donations from persons specially interested in the invention or information sought.

The distribution of prizes is a matter of sufficient importance to merit the fullest and most earnest consideration of the men to whose determination it is committed. The principal service of fairs to exhibitors is the advertising given to the articles exhibited. In order, therefore, to obtain articles for the fairs, it is necessary that the prizes should be so distributed as to call out an active competition among those having wares to sell. But as the object of this class of exhibitors is mainly to secure the certificate of a tribunal supposed to be impartial, diplomas would generally be as efficacious as costly medals.

There is another class of competitors for whom the only suitable prize is a sum of money—the experimenters. A few years since the Massachusetts Agricultural Society offered a premium for the best experiment to test the comparative value of cooked and uncooked food for swine; and the facts developed by this offer have passed into the standard literature, and have become a portion of the established science of agriculture. Reading the reports of such experiments may be dull and prosy compared with the inspection of mammoth oxen or over-fattened hogs, but they exert a powerful influence in permanently raising the position of the Society, and they are of immeasurable value to the community. The proper compensation for the labor of weighing, measuring and recording necessary in experiments, is an adequate sum of money.

If committees and managers to whom the arranging of premiums and prizes is committed will give their thought to the matter, doubtless many improvements over the usual stereotyped course will be suggested, our design at this time is simply to call attention to the importance of the subject.

MARKET FOR THE MONTH.

Notwithstanding the important public events of the month of April, the capture of Lee's army, and the assassination of President Lincoln, the markets during the month have been remarkably free from fluctuations. The following table shows the change in price of the leading staples:—

	Price March 28.	Price April 26.
Coal (Anth.) ℔ 2,000 lb.	$13 00 @13 50	$11 00
Coffee (Java) ℔ lb.	33 @ 35	33 @ 35
Copper (Am. Ingot) ℔ lb.	34 @ 36	34 @ 36
Cotton (middling) ℔ lb.	@ 50	50 @ 51
Flour (State) ℔ bbl.	$9 25 @ 9 75	$7 00 @ 7 90
Wheat ℔ bush.	2 25 @ 2 50	2 20 @ 2 50
Hay ℔ 100 lb.	1 60 @ 1 70	1 32
Hemp (Am. drs'd) ℔ tun.	275 00@300 00	275 00@350 00
Hides (city slaughter) ℔ lb.	7½@ 9	8 @ 9⅛
India-rubber ℔ lb.	65 @ 1 05	51 @ 90
Lead (Am.) ℔ 100 lb.	9 75 @10 00	9 75 @ 9 87
Nails ℔ 100 lb.	7 50	7 00
Petroleum (crude) ℔ gal.	33	37 @ 37½
Beef (mess) ℔ bbl.	$13 00 @21 00	12 00 @20 00
Saltpeter ℔ lb.	28	28
Steel (Am. cast) ℔ lb.	15 @ 27	14 @ 22
Sugar (brown) ℔ lb.	9½@ 14½	10½@ 15
Wool (American Saxony fleece) ℔ lb.	75 @ 85	75 @ 85
Zinc ℔ lb.	14 @ 15	13½@ 14
Gold	1 54	1 51¾

A SWEDISH MONITOR.—The launch has just been safely effected in Stockholm of the *John Erikson*, the first Swedish monitor. She measures 205 feet long by 46 wide. The side plating is five inches thick, and around the turret it is 12 inches, as is also that which protects the rudder. The vessel will be provided with six engines.

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TREATISES AND INVENTIONS DESIRED IN FRANCE.

We find in the last number of *l'Invention* a list of the prizes offered by the Industrial Society of Amiens, and though it is too late for competition from this country, the list may be interesting; we accordingly present a brief translation.

First—Memoir on the fabrication and sale of bricks in the department of the Somme. Silver medal.

Second—Memoir on the construction of the buildings and the arrangement of the machines for the manufacture of linen, cotton and wool cloth. Gold medal.

Third—Memoir, with designs on machines, for raising the materials in constructing buildings. Silver medal.

Fourth—Prize for the invention of a pyrometer for measuring the temperature of the gases escaping from the furnaces of steam boilers. Silver medal.

Fifth—Prize for the best heaters of steam boilers in the department of the Somme. $100.

Sixth—Prize for the invention and application of a good meter for measuring the water fed to steam boilers. Gold medal.

Seventh—Prize to be distributed to a certain number of workmen of the department, remarkable for their conduct, labor, morality and devotedness.

Eighth—Construction of a power loom in which the feed and take-up shall proceed regularly without requiring any manual adjustment from the beginning to the end of the work. Gold medal.

Ninth—Construction of an automatic knitting loom making the return stitch. Gold medal.

Tenth—Construction of an automatic knitting loom, making the return stitch and narrowing. Gold medal and $20.

Eleventh—Prize for the best description of a spinning of wool mixed in all its parts. $60 given by M. Vayson.

Twelfth—Prize for the best description of a dye-house for dyeing woolen yarn in the skin; the heating to be done by steam, which must also supply a small engine. $40 given by M. Vayson.

Thirteenth—Prize for the invention of a good dressing or facing for linen cloth. $20 given by M. Boudard.

Fourteenth—Memoir on the improvement of lands. Silver medal.

Fifteenth—What will be the advantages of the cultivation of tobacco in the department of the Somme. Silver medal.

Sixteenth—Indicate new means for the preservation of grains in store. Gold medal.

Seventeenth—Present the finest and richest collection of woods of the country, worked and in the rough. Silver medal.

Eighteenth—To find for the velvets of Utrecht, a dressing filling the following conditions:—1st, To be without odor; 2d, Not to alter, either in color, softness or brilliancy; 3d, To preserve the softness of the tissue; 4th, Adapted to any length of nap. Gold medal and prize of $20.

Nineteenth—To find the means of producing the bitartrate of potassa, otherwise than by deposit from wines. $200.

Twentieth—For a composition which in dyeing woolens will replace with a notable economy tartar in colors requiring the employment of the salts of tin. $200 and a gold medal.

Twenty-first—To find the means of giving immediately and with economy to the decoctions of Campeachy the tinctorial force which they acquire only by age. Silver medal.

Twenty-second—To find for dressing cotton velvet a preparation which will replace animal glue, at the same time giving suppleness to the tissue, and preserving to it the strength necessary for sale. The mucilage must be economical, without odor, and without action on the colors. Gold metal.

Twenty-third—For specimens of cotton velvet having the qualities of English velvet in color and solidity. Gold medal.

Twenty-fourth—For an easy means of detecting the adulteration of oils. Gold medal.

Twenty-fifth—For a better means of bleaching cotton velvet, cut and not cut. Silver medal.

Twenty-sixth—For a lubricating oil. Gold medal.

Twenty-seventh—The invention of a machine to measure in a practical manner the lubricating qualities of oils.

Twenty-eighth—A means of applying in a practical manner hydrate of alumina to the filtration of sugars.

Twenty-ninth—A memoir on the use of trade marks, and the means of rendering them practically efficacious.

Thirtieth—To set forth the advantages and the inconveniences which result, in both a moral and material point of view, from an increase of the working population in the great manufacturing centers, in consequence of the development of industry. Gold medal.

Thirty-first—Study on the industrial arts in the department of the Somme, and on their progress or decline from the thirteenth century to the present time. Gold medal.

Thirty-second—Study on the habitual maladies of the workmen of the department of the Somme, following their diverse professions. What are the hygienic measures to be employed for each class of workmen? Gold medal.

"Cannel Coal."

About a century ago the celebrated Duke of Bridgewater was the proprietor of a large estate situated at a place called Worsley, seven miles from Manchester. This estate contained numberless valuable coal seams, easily to be got at, but nevertheless comparatively worthless, in consequence of the great expense and difficulty of transporting the coal to market. The Duke, being a singularly enterprising individual, determined, if possible, to remedy this defect, and by one of those happy coincidences which so frequently reward a praiseworthy effort, he found, in the self-instrncted genius James Brindley, the very man to contrive the means for securing the desired end. Suffice it to say that Brindley constructed an excellent profit-paying canal between Liverpool, Manchester, Worsely, and the Great Wigan district. This canal appears to have been finished about the year 1766, and store-houses were built at various points at its course, where the Duke's coal was deposited, for the purpose of supplying the immediate neighborhood. At this time the word "kennel" or "kannel" was generally employed in Lancashire and Cheshire to designate an artificial watercourse; and even Brindley himself, in some of his letters, speaks of a new undertaking as "the Duke's kennel." It is not, therefore, surprising that the Duke's coal should have received the name of "kennel coal," being, so to say, kennel borne; and this name would be peculiarly applicable at Liverpool, where sea-borne coal from Whitehaven, in Cumberland, had long been in use, and was, moreover, an article differing in many of its qualities from the Duke's coal. That this is the true origin of the name now applied to this kind of coal is further established by the fact that the eminent geologist Werner, who visited the coal districts of England not long after the above period, has adopted the very word, and in speaking of the Wigan coal calls it "kennel kohle." This word has indeed been lately written "cannel" in this country, and some ingenious persons, finding themselves quite at a loss to discover the source of such a name, come to the conclusion that it is derived from the word "candle," and to support this they have asserted that slips of this kind of coal will burn like a candle; an assertion which we need hardly say is altogether fabulous.—*Newton's Journal of Arts.*

SPECIAL NOTICES.

JAMES WARREN, of Springfield, Mass., has petitioned for the extension of a patent granted to him on the 15th day of July, 1851, for an improvement in revolving breech-loading fire-arms.

LEWIS LILLIE, of Troy, N. Y., has petitioned for the extension of a patent granted to him on the 15th day of July, 1851, for an improvement in fire-proof safes.

Parties wishing to oppose the above extensions must appear and show cause on the 26th day of June next, at 12 o'clock, M., when the petition will be heard.

WHITE-WASHED walls which are to be papered should be well brushed over with strong vinegar previously, or the paste will not adhere.

IT is asserted that the disbandment of Lee's army has reduced the expenses of Government $1,000,000 a day.

ISSUED FROM THE UNITED STATES PATENT-OFFICE
FOR THE WEEK ENDING APRIL 25, 1865.
Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

47,374.—Slide for Extension Table.—Erastus P. Allyn, North Canan, Conn.:

I claim a slide for extension tables manufactured of malleable cast-iron or other metal, with its parts fitted together by the dovetail projections and recesses, and provided with stops, substantially as herein described.

[This invention consists in having a series of slides of malleable cast-iron, and fitted together by means of dovetail projections and grooves, and provided with stops, whereby a very economical and desirable slide for the purpose specified is obtained, and the annoyances and embarrassments occasioned by the shrinking, swelling and warping of the ordinary wooden slides are avoided.]

47,375.—Coffin Handle.—Ira Almy, Farmer, N. Y.:

I claim a detachable coffin handle, secured to a coffin through the medium of a plate applied in the manner substantially as shown and described.

[The object of this invention is to obtain a handle which may be readily applied to a coffin, and detached from it in a moment of time, and without the aid of any mechanical tools, whereby a set of handles may be applied to an indefinite number of coffins, the former being applied to a coffin when the body is placed in it, and removed when the coffin is to be encased or deposited in its final place.]

47,376.—Paper Bag.—James Arkell, Benj. Smith and Adam Smith, Canajoharie, N. Y.:

We claim as a new article of manufacture a quadrangular paper bag, with a double bottom produced by folding and pasting in the particular manner herein described.

[This invention consists in making or preparing paper bags in such a way as to give to them at their upper ends a flexible character, so that when properly filled with flour or other substances the sides of the bags at their upper ends will come together after the manner of the sides of a cloth bag.]

47,377.—Steam Engine.—John Baird, New York City:

I claim, First, A horizontal engine, provided with a box framing near and attached to the cylinder, and containing vertical pumps, substantially as described, said framing also constituting the condenser, or the channel ways thereof.

Second, I claim a horizontal engine, having a box framing, containing pumps and an independent pillow block framing, when the latter is combined with the former by wrought-iron rods, substantially as described and for the purpose specified.

Third, I claim arranging engines having the characteristics set forth in the second claim, on opposite sides of a vessel, when such engines have openings through the framing for the passage of a propeller shaft or shafts, substantially as hereinbefore described.

47,378.—Table and Desk.—Cyrus Baldwin, Manchester, N. H.:

I claim the combination of the table and writing desk, when arranged to operate substantially as set forth.

47,379.—Hay Rack.—Goldsmith Baldwin, Bluffton, Ind.:

I claim the binder, B and C, or their equivalent, for the purposes set forth.

47,380.—Cultivator.—Lester B. Barton, Metamora, Ill.:

I claim the hinged or jointed frame, E, placed within the main frame, A, as shown, in combination with the laterally-swinging shovel or plow standards, g g, levers, J J, with stirrups, K K, attached, and the curved or bow-shaped bar, M, all arranged to operate substantially as and for the purpose herein set forth.

[This invention relates to an improved cultivator, of that class in which the plows or shovels have a lateral adjustable movement, in order that they may be made to conform to the sinuosities of the rows of plants, and cast the earth up to the same or cast it there from, without the liability of plowing out the plants or injuring the roots thereof.]

47,381.—Coal-oil Burner.—W. W. Batchelder, New York City:

I claim the employment, in combination with a tubular wick holder and vapor or gas-generating and air-mixing chamber, of a perforated plate, or the equivalent thereof, together with a metallic or other heat conductor or conductors projecting downwards and dipping into the wick, substantially in the manner herein described, for operation as herein set forth.

47,382.—Microscope.—J. J. Bausch (assignor to Bausch & Lomb), Rochester, N. Y.:

I claim the combination of the object piece, A, eye piece, B, and spring, C, substantially as and for the purpose herein set forth.

47,483.—Churn.—Charles F. Baylor, Clinton, N. J.:

I claim the combination of the belt and rollers, substantially as described, with the slides, S and T, attached to the dasher shafts, and the block or attachment, J, deriving its motions from the hand crank and its connections, as described and represented.

47,384.—Shaking and Rocking Table for Amalgamating Gold, Etc.—Adolph Behr and Wm. James Ward, Black Hawk, Colorado:

We claim a shaking or rocking table, with amalgamated copper or brass riffles or grooves, which may be charged with more or less additional quicksilver, alone or in connection with one or more wooden riffles or grooves, in the shape and manner above described, or constructed in any manner, substantially the same, which will impart to substances suspended in water both the sifting and splashing motion which throws and forces the particles in contact with the amalgamated surface of the copper or brass riffles or grooves.

47,385.—Manufacture of Soap.—Jacob B. Bennett and James S. Gibbs, Buffalo, N. Y.:

We claim the agitation and commingling by any suitable machinery of the ingredients used for making soap in a closed vessel while under heat and pressure sufficient to insure the desired new combinations, and produce cheaply and quickly a uniform good quality of soap.

47,386.—Straw Cutter and Feed Mixer Combined.—E. F. Bishop, Burton, Ohio:

I claim the special arrangement of the hopper, H, mixer, F, shaft,

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d, within its arms, f, and spout, g, in combination with the straw cutter, when operating conjointly, substantially as and for the purpose set forth.

47,387.—Press.—Louis Boudreanx, Thibodaux, La.:

In combination with the toggles, I I, and beater, H, I claim the shaft, C, and jacket, F, so constructed as to be coupled and uncoupled by the lever, G, and adapted to permit the rope, K, to be unwound and the beater to be raised without reversing the motion of the wheel, L.

[This invention relates to a new and improved press for compressing substances such as cotton, hay, etc., for the purpose of baling the same. The invention consists in the employment or use of toggle levers and a windlass arranged in a novel manner, so that the press may be used in either a vertical or horizontal position, and by any convenient power.]

47,388.—Coupling for Shafting.—Robert Briggs, Philadelphia, Pa.:

I claim the construction of couplings for shafts of a cylindrical casting or forging, C, with a slot or opening, n, along one side, and clamped together by bolts, b, as described.

47,389.—Galvanic Battery.—Daniel J. Brown and Cyrus W. Baldwin, Boston, Mass.:

We claim the arrangement of the separate iron positive bars or rods, C C, radially around, and in combination with the carbonaceous negative plate, D, substantially as and for the purposes herein specified.

47,390.—Engine for Operating Rock Drills.—James D. Butler, North Adams, Mass.:

I claim the combination and arrangement of the piston, E, the openings, c c', the piston rod, F, its packing, b*, the piston, G, and the openings, d, with the cylinders, K A, the tubular piston rods, C D, and the hollow cones, I and L, and the gibs, J J, the whole being constructed in manner and so as to operate substantially as described.

I also claim the combination of the crosshead, Q, and the slides, Q'' (constructed and operating substantially as described), with the drill, N, and the tubular piston, C. And I also claim the combination of the collar, Q', therewith, the same being for the purpose specified.

I also claim the connection of the crosshead, Q, with the piston rod, C, in such manner that there may be a freedom of transverse and rotary motion with reference to one another, as and for the purpose hereinbefore described.

I also claim the combination of the cushioning space, x, and the piston extension, b'' b''', or their equivalents, with the port, r', arranged in the cylinder, and with reference to such space, substantially in manner as specified.

I also claim the construction of the cylinder, A, with the reduction of bore, as shown at a a', and with the piston, B, with the part, b b', to operate in such reduction, the port, r, being disposed with reference thereto as specified.

I also claim the combination of the spring, M, the nut, H, and the series of notches, h h, or their equivalents, with the hollow cone, I, the same being substantially as and for the purpose described.

I also claim the combination of the segments, P P', of a conical ring, the cylinders, p p' and p'' p''', the ring, p'', and the hollow cones in the head, A'', and the follower, A''', the whole being substantially as and for the purposes set forth.

I also claim the combination of the spring, W, the pin, w, and the yoke V'', with the valve steam, U, and the slide bar, V, constructed, arranged and operating substantially as described.

I also claim the combination as well as the arrangement of the piston, E, the piston rod, F, its packing, b,* and the piston G.

Also, The combination of the openings, c c' and d, the piston rods, D F, arranged with a tubular space between them, the pistons, E and G, and the packing, b*, the whole being arranged substantially as described.

47,391.—Artificial Skating Pond.—M. C. Campbell, Philadelphia, Pa.:

I claim The preparation of a surface with a congealed material or composition substantially as described and for the purpose specified.

47,392.—Curtain Fixture.—James Chase and Wm. S. Longhborough, Rochester, N. Y. Antedated April 15, 1865:

We claim the combination and relative arrangement of the guide loop, i, on the bracket, b, with the spool and oblong journal socket, c, and stop, e, the parts being constructed and operating in the manner and for the purposes shown and described.

47,393.—Apparatus for Obtaining Extracts from Vegetables, etc.—John Chillcott, Brooklyn, N. Y. Antedated April 20, 1865:

First, I claim subjecting the substances to the action of heat in a steam tight chamber or box in which they are separated by perforated shelves and in which they are surrounded by an atmosphere of steam, but protected from direct contact with the steam during the whole or any portion of the extracting process substantially as herein described.

Second, Providing between such chambers a connecting steam pipe, F, by which steam can be admitted among the substances under treatment during any stage of the process, substantially as herein specified.

47,394.—Process for preparing Grain for Distillation.—John Chillcott, Brooklyn, N. Y. Antedated April 15, 1865:

First, I claim the process of preparing grain for distillation by steaming and crushing it between rollers substantially as herein described,

Second, I claim the combination of the steaming vessel, A, perforated pipe, d, hopper, B, and rollers, C C', substantially as and for the purpose set forth.

47,395.—Mode of Splicing Timbers.—H. M. Claflen, Cleveland, Ohio:

First, I claim the knobbed plates, C', as and for the purpose se forth.

Second, I claim the knobbed plates, C', in combination with the link, C, or its equivalent substantially as and applied to the purpose specified.

47,396.—Breech-loading Fire-arm.—John W. Cochran, New York City:

I claim the safety pin, h, applied and operating substantially as herein described in combination with the hammer and with a spring catch applied to lock the barrel opposite the breech as herein set forth.

47,397.—Horse-shoe.—William Coes, Worcester, Mass.:

I claim the bars, A C C, connected by joints and provided respectively with a toe piece or cap, B, and lips, D D, and the bars, C C, constructed or secured by a suitable catch or fastening substantially as and for the purpose herein set forth.

[This invention relates to a new and improved horse-shoe of that class which are secured to the hoof without the aid of nails, so that they may be removed from and secured to the hoof at any time without the services of a smith or shoer.]

47,398.—Mop Head.—Stillman Cooper, Antwerp, N. Y.:

I claim the fixed or permanent jaw, A, provided with oblong slots, h h, and notches, d d, in combination with the movable or adjustable jaw, B, provided with pins g g, and teeth, e, and the sliding collars, C C, fitted or placed on the sides c c f f, of the jaws, substantially as and for the purpose set forth.

47,399.—Oil Ejector.—Erastus Crooker, Buffalo, N. Y.:

I claim a steam pipe covered with gutta percha or other equivalent material fitting closely thereto, in combination with an ejector and discharge pipe, substantially as and for the purpose set forth.

47,400.—Device for Well Boring.—James Donnell, Allegheny City, Pa.:

I claim the combination of two teethed rings, the teeth of which have one side parallel and the other side at an angle to the axis of the rings, with the bevelled arms, o o', of a shaft which has a reciprocating motion between the rings, for the purpose of producing an intermittent rotary motion of the shaft, or rings, according as one of them is fixed and the other capable of rotation, at each stroke of the shaft; the length of the arc of motion at each half stroke being regulated by the number of teeth in each of the rings, substantially as herein, before described

47,401.—Sap Pans.—Henry Earl, Edwards, N. Y.:

I claim, First, The combinatin of the receiving pipe, A, with the steam pipe, D, substantially as and for the purpose set forth.

Second, The combination of the movable pan, H, with the pipes, A and D, substantially as and for the purpose set forth.

Third, The combination of the steam box, K, with the movable pan, H, substantially as and for the purpose set forth.

Fourth, The combination of the main pan, M, with the steam box, K, substantially as and for the purpose set forth.

Fifth, The combination of the slide or gate, o, with the main pan, M, substantially as and for the purpose set forth.

Sixth, The winding arrangement or channelling the pan, by means of which the sap, being admitted at the central or hottest part of the pan, is conducted to the outer or cooler parts of said pan substantially as described and for the purposes set forth.

47,402.—Process for Treating Sirup and Saccharine Solutions.—Edward P. Eastwick, Baltimore, Md. :

I claim the use of acids, acid salts or neutral salts for the purpose of decomposing and altering the coloring compounds in molasses and analogous sirups, the products of mother liquor remaining after the crystallization of the sugar manufacture or refining.

47,403.—Awl.—R. Egan, Brooklyn, N. Y.:

I claim, First, Constructing awl hafts in the manner substantially as above described.

Second, In combination with the screw threaded socket piece, B, constructed as specified, I further claim forming a screw thread upon the shank of the awl as and for the purpose set forth.

[This invention consists in a novel manner of fastening an awl into its haft, whereby it is easily and securely fixed in place without strain upon the awl and without the usual liability of splitting the handle.]

47,404.—Sawing Machine.—William Emris and Henry J. Bosworth, Hudson, Mich.:

We claim the lever, S, in combination with the spring, V, when constructed and operated substantially as and for the purpose herein set forth.

47,405.—Drop Hammer.—John Evans, New Haven, Conn.:

I claim the combination of the connecting rod with the hammer, when they are constructed and attached, substantially as herein described.

Second, I claim the combination of the connecting rod with the crank pin, when they are constructed, arranged, and fitted for adjustment substantially as herein described and set forth.

47,406.—Pencil and Eraser.—W. R. Evans and L. D. Benner, Thomaston, Maine :

We claim the combined pencil and eraser above described, constructed substantially in the manner above set forth.

47,407.—Smelting Copper Ores.—Wm. L. Faber, New York City:

I claim the within described process for expelling antimony and arsenic from copper and copper ores by roasting with some substance developing chlorine during the process of roasting, substantially as herein set forth.

[The object of this invention is to remove from copper and copper ores during the process of smelting such impurities as antimony and arsenic, and this purpose is effected by a process which is strictly confined to copper and copper ores, and which has to be modified materially for treating other ores.]

47,408.—Carriage Jack.—Austin W. Field, Vergennes, Vt.:

I claim the stock or standard, in, perforated sliding bars, B B, and lever, D, in connection with the pin, E, all arranged substantially as shown and described to form a new and improved carriage jack.

[This invention consists in the employment or use of two parallel slides fitted in a suitable stock or standard, and having a lever placed between their upper ends, all being arranged in such a manner that the device may be readily applied to axles of any hight, and the latter elevated and secured in such position with the greatest facility, to enable the wheels to clear the ground or floor, so that they may be removed from and placed on the axle for lubricating purposes.]

47,409.—Coal Breaker.—Jacob Fox, Philadelphia, Pa.:

I claim a stationary hopper, B B, adjustable at the bottom, to regulate the size of coal, substantially as described and for the purpose specified.

Second, I also claim the vibrating plates, c c, in combination with picks, D D, substantially as described and for the purpose specified.

Third. I also claim a stationary hopper, B B, with picks, D D, in combination with vibrating plates, c c, or their equivalents, as and for the purpose specified.

47,410.—Mode of Treating Oil Wells to Remove Paraffine, Tar, etc.—J. Fraser, Buffalo, N. Y.:

I claim the method of treating petroleum wells with hot liquids for the removal of obstructions composed essentially of paraffine, substantially as set forth.

47,411.—Apparatus for Delivering Paper from Printing Presses.—C. O. Furbush, Machias, Me.:

I claim the bars, D E, provided respectively with jaws, c d, the projection f, and pin, e, in combination with inclined planes, g g, the spring, F, and the bolt, C, by which the jaws are opened and closed at the appropriate times to receive, clasp, convey, deliver and return, substantially as above described and represented.

[This invention consists in the employment or use of nippers arranged in such a manner as to have a reciprocating motion to convey the sheets from the press.]

47,412.—Winding and Setting Watches.—Frederick A. Giles, New York City :

I claim the combination of the wheel, C, having two series of teeth, a and c, turning on a fixed pivot, n, the two pinions, b d, movable lengthwise upon the arbor, the spring, f, and the sliding pin, h, the whole arranged and applied in relation to the wheel, A, and the cannon pinion, substantially as herein specified.

47,413.—Ventilator.—Henry A. Gouge, Brooklyn, N. Y.:

I claim, First, The ventilating apparatus described, with the several parts arranged and acting together substantially as set forth.

Second, The combination of light, F, flues, B and C, and ventilator, E, constructed and arranged substantially as and for the purposes described.

47,414.—Coffin.—Thomas Graham, Philadelphia, Pa.:

I claim the vessels, G, containing alcohol or other equivalent fluid, and arranged in a coffin so as to be detachable therefrom, as set forth, for the purpose specified.

47,415.—Grape Wire Support.—F. B. Green, Seneca Falls, N. Y. Antedated April 17, 1865.

I claim making the frame or support, B, adjustable vertically between the posts, A A, by means of the adjusting holes and pins, d f, or equivalent, the whole arranged, combined and operating substantially in the manner and for the purpose herein set forth.

47,416.—Roofing Composition.—Nicolaus Groh, Helenville, Wis.:

I claim a roofing compound made of the ingredients herein described, and mixed together about in the proportion and substantially in the manner herein set forth.

[This invention relates to a roofing compound which is perfectly impervious to water, and which is also fire-proof.]

47,417.—Grain Separator.—John H. Hamaker, Trease's Store, Ohio :

I claim the construction of the carrier, with the close and open portions together, with the transverse grooves, a a, and projections, d d, substantially as and for the purpose herein specified.

I also claim conveying the straw and grain forward and upward on a single carrier, by giving the said carrier a rapid vibratory motion through the means of the double sets of cranks and auxillary connecting rod, substantially as and for the purpose set forth.

I also claim communicating the vibratory motion to the shoe directly from the vibrating carrier by means of the connecting rod, G, or its equivalent, as herein described.

47,418.—Lamp-shade Holders.—James Hanley, New York :

First, I claim the making a ring attachment with clips, for the purpose of holding the shade and connecting with the lamp.

Second, I claim the clips.

Third, I claim the mode of connecting the shade to the lamp glass by suspension.

Fourth, I claim the loose hanging of the shade, and the consequent horizontal action.

Fifth, I claim the creasing of the paper. Each claim substantially in the manner and for the purpose as herein described and set forth.

47,419.—Marine Propeller.—Austin S. Hatch, Addison N. Y.:

I claim the combination and arrangement of the double screws or wheels, C D, revolving in opposite directions, and the taper form of the hull or bottom of the vessel before and behind the said screws or wheels, and in combination of the form of their blades, substantially as and for the purposes herein specified.

47,420.—Removing Foreign Substances from Sugar.—Jonas Hoover, Oscaloosa, Iowa :

First, I claim treating crude sugar to alcohol and sweet milk, substantially as and for the purpose specified.

Second, I claim subjecting sugar to a second pressure between cloths, after the same has been moistened with alcohol and milk and pressed once, substantially as described.

47,421.—Implement for Cutting Rubber, etc.—Emil Hubner, New York :

First, I claim an adjustable circular packing cutter, constructed as herein described, as a new article of manufacture.

Second, The movable head, C, holding the knife, d, in combination with the rule, A, screw handle, D, and stationary center, a, constructed and operating substantially as and for the purpose set forth.

Third, The swiveling or stationary arm rest, b, in the stationary head, B, in combination with the center, a, and adjustable knife, d, constructed and operating substantially as and for the purpose described.

47,422.—Stair Rod Fastening.—Henry Jackson, Brooklyn, N. Y.:

I claim the spring, D, dish, E, and the supplemental shoulder, c, applied to one or both buttons, in connection with the flat stair rod, having its flanges, a, provided with curved notches, e e, all arranged substantially as and for the purpose herein set forth.

[This invention relates to an improvement in the ordinary fastening hitherto employed for securing flat stair rods to the "risers" of the stairs, and it consists in the application of a spring to one of the buttons composing the fastening, whereby the rods are securely fastened, being prevented from casually slipping off from the buttons by a longitudinal movement.]

47,423.—Fire Place.—Wm. H. James, Cincinnati, Ohio:

I claim as a new article of manufacture the fire-place composed of the elements, A B C D E F and G, the same being formed, combined and adapted to operate in the manner set forth.

47,424.—Steam Engine.—Henry Johnson, Pittsburgh, Pa.:

I claim the use of a movable disc or independent piston seated in the steam cylinder above the working piston, with a steam space between it and the cylinder head, through and into which the live steam from the boiler is caused to pass on its way to the steam chest of the engine, for the purpose of a steam cushion, and to increase the efficiency of the steam engine, substantially as hereinbefore described.

47,425.—Machine for Grinding Paper Pulp.—John F. Jones, Rochester, N. Y.:

I claim the machine for grinding paper pulp, having the grinding surfaces, d d, made dishing or inclined upward from the center to the periphery, and used in connection with the case, H, the whole arranged and operating substantially as and for the purpose herein set forth.

47,426.—Gas Heater.—J. H. Jones, New York City :

I claim the combination and arrangement of the concave or inverted conical-shaped screen, C, and tube, A, in connection with a gas jet or opening, G, for the purpose herein set forth.

47,427.—Machine for Oiling Wool.—James Kelly, Troy, N. Y.:

I claim the two rollers, A A', one of which dips in a cistern containing oil, while the other serves to spread the wool, when used in combination with a can, C, and pipes, b c, arranged substantially as herein set forth, for the purpose of keeping up a uniform supply of oil to the lower roller.

[This invention consists in oiling the wool between two rollers, one of which runs in a cistern containing the oil, in such a manner that by the action of the two rollers the wool is spread in a thin sliver or sheet, and the oil taken up by the lower roller is communicated uniformly to all the fiber.]

47,428.—Universal Chuck.—Wm. Haskell King, Troy, N. Y.:

I claim a concentric or other chuck, provided with one or more laterally adjustable plates, substantially as herein shown and described, for the purpose of converting a concentric chuck into an eccentric chuck, as set forth.

[This invention relates to a new and improved chuck for lathes, by which the eccentric and concentric chucks are combined and the chuck rendered capable of being adjusted to suit any kind of work to be operated upon in the lathe.]

47,429.—Hanging and Latching Farm Gates.—Ira Kinman, Freeport, Ill :

I claim, First, The arrangement and combination of the adjustable hinges, P and K, operating on the rings, H and I, on the back post, as herein described, and for the purposes set forth.

Second, I also claim the construction and combination of the up right bolt, A, with the movable latch, B, as operating on the staple E, and movable prop, G, as herein described and for the purpose set forth.

Third, I also claim the construction and combination of the self-acting prop, G, and staple, E, as herein described, and for the purpose set forth.

47,430.—Jewel Case.—G. F. Kolb, Philadelphia, Pa.:

I claim the within-described jewelry case, composed of the lower portion, A, the upper portion or lid, A', the leaf, B, and spring, D, the whole being constructed and operating substantially as and for the purpose herein set forth.

47,431.—Metallic Skeleton Hat Frame.—Albert Komp, New York City :

I claim forming the frame for a hat body of hoop-skirt spring wire, by forming two hoops, and by connecting the same with three or more vertical stays, by means of clasps formed of thin metallic strips, each of said clasps being shaped into a horizontal part, O P, and a vertical part, R, cut to the required shape and bent over, and pressed to the joint, substantially in the manner and for the purpose substantially as described.

47,432.—Fountain Pen.—R. J. LaMothe, New York City :

I claim, First, The spring ink-conveyor, formed as a trough, passing through an opening near the pen, in the manner and for the purposes specified.

Second, I claim the pencil, x, formed in the manner set forth, and combined with the plunger of the fountain pen, as specified.

47,433.—Washing Machine.—Andrew F. Lapham, New York City :

First, I claim the spring, M, combined and arranged relatively to the rocking box, D, and bed, A, or its equivalent, substantially in the manner and for the purposes herein set forth.

Second, I claim the hinged boards, H H, and springs, I I, in combination with a rocking box, D, adapted for washing or churning, substantially as and for the purpose herein set forth.

47,434 —Apparatus for Inhaling Vapors.—A. P. Lighthill, Boston, Mass.:

I claim the exhalation apparatus, substantially as and for use in manner as described.

47,435.—Churn.—John B. Lindsay, Davenport, Iowa :

I claim, first, Arming the blades of the dasher of the churn

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churn with leaves set vertically upon their upper faces, substantially as described.

Second, The combination of the twisted shank of the dasher with a dasher constructed of vertical and horizontal leaves and blades, substantially as described.

[The object of this invention is to produce a churn which shall combine the simplicity and convenience of form of those in common use, with cheapness of construction and increased capacity for successfully doing its work, and it consists in arming the blades of the dasher with leaves of metal or other suitable material, set at right angles to them, and also in combining therewith the screw shank of the dasher.]

47,436.—Gear-cutting Rules.—C. B. Long, Worcester, Mass.:

I claim a gear-cutting rule upon which is marked in figures the numbers of cogs of a given pitch which can be cut upon a given diameter of a wheel, substantially as and for the purposes described.

I also claim making the first inch of the rule with a figure or figures to indicate the number of cogs of a given pitch which can be cut upon a wheel of one inch in diameter with allowances for pitch line, substantially as set forth.

47,437.—Hay Spreader.—David Lyman, Middlefield, Conn.:

First, I claim in combination with the teeth for scattering the hay of a spring attachment so arranged as to allow the teeth to yield upward in accordance with the irregularities of the ground, substantially in the manner herein set forth.

Second, The method herein described of attaching the teeth of hay-making or spreading machines to blocks, or the equivalents thereof, capable of sliding up and down, substantially as set forth.

Third, In hay-making or spreading machines in which levers are used having an up-and-down and back-and-forth motion, I claim the teeth when constructed and combined with springs, giving them elasticity both backward and upward, as described.

47,438.—Photographic Name Plate.—James E. Mackerley, Paint, Ohio:

I claim as an improved article of manufacture, an adjustable photographic name plate, made substantially as herein shown and described.

I also claim the employment, in combination with the said name plate, of the movable letters or cards, substantially as and for the purpose set forth.,

[This invention relates to a novel device to be used by photographers, the object of which is to secure, in addition to the photographing of the sitting person or of a picture or view, and upon one and the same negative plate, the full or any desired portion of the person's name or the title of the picture view.]

47,439.—Cultivator.—Roswell Marsh, Steubenville, Ohio:

I claim the combination of the rotating cylinder with the digging forks and the clearer, substantially as described and for the purpose set forth.

47,440.—Railroad Car Brake.—A. F. McCrone, Ellicott's Mills, Md.:

I claim the coupling and brake-operating bars, extending through the length of the train and operated by the steam from the engine to rotate the pinions to whose shafts are attached the crossheads which connect by suitable rods and levers with the rubber bars, the whole described arrangement being constructed and operated substantially as described.

47,441.—Oil Press.—Wm. V. McKenzie, Jersey City, N. J.:

I claim, first, The combination of the separate slides. D D, and mortises, g g, with the sides, B, of the press boxes, when constructed and arranged to operate as herein specified.

Second, The lips, c, in combination with the slides, D, grooves, d, and sides, B, of the press boxes, constructed and operating substantially as and for the purpose described.

Third, I claim the pipes, E F, with branch pipes, e f, arranged in combination with the movable sides of a press, substantially as specified, so that said branch pipes retain sufficient spring to allow of the motion of the sides of the press boxes.

47,442.—Beer Faucet.—John Miller, Buffalo, N. Y.:

I claim the combination with the plunger, C, of the valve nozzle, F, discharge nozzle, D, operating for the purposes and in the manner described.

47,443.—Hot-air Furnace.—Joseph A. Miller, New York City:

I claim, first, Forming a heat reservoir between or within the tubes of a hot-air furnace by means of lamps or pieces, L L, of brick or other material which is a poor conductor of heat, so applied that the flame and heated gaseous products of combustion may circulate through interstices between the said lumps or pieces, substantially as herein specified.

Second, The arrangement of the horizontal flue, C, drop flue, I, forward and backward circulation pipe flue, J, in combination with each other and with the cold air chamber, H, tube sheets, D D', air tubes, G G, and air-distributing chamber, E, substantially as herein specified.

47,444.—Oil Ejector.—Geo. E. Mills, New York City:

I claim, first, The use of corrugated metal for tubing oil wells, the same being supported on a perforated bulb, and cone-pointed base, substantially as herein described.

I claim the tube, C C', put together in sections, and secured by screws in sockets, on the air pipe, E, so that the point where the air comes in contact with the fluid, may be adjusted in hight, as and for the purposes set forth.

47,445.—Washing Machine.—Jarvis T. Mudge, Cleveland, Ohio:

First, I claim the plunger, C, moving in a vertical plane upon the pivot or hinges, c', and operated by a system of levers, substantially as herein described.

Second, I claim the use of the tubes, C', in connection with the plunger, C, to prevent the water from overflowing and adding weight to the latter, as explained.

47,446.—Ratchet Brace.—L. H. Olmstead, Newark, N. J.:

I claim, first, The combination of the frame, B, and handle, S, of the ratchet brace, constructed and arranged substantially as set forth.

I claim making the main spindle of a ratchet brace, with a part of the thread cut away between the socket for the drill and the upper end of the spindle, as shown and described, and for the purpose set forth.

47,447.—Manual Power.—I. E. Overpeck, Overpeck's Station, Ohio:

I claim the arrangement of the connecting rods, c c, at an angle to a vertical line drawn through the center of the crank shaft of wheel, b, to operate in combination with levers, d and e, of my manual power sawing machine, substantially as described for the purposes specified.

47,448.—Chimney.—C. C. Phelps, Janesville, Wis.:

I claim the construction of chimneys, of cast iron or its equivalent, in sections substantially as described and for the purpose specified.

47,449.—Shingle Sawing Machine.—C. L. Pierce, Buffalo, N. Y.:

I claim the combination of two pair of "dog ." C C', with the reciprocating table, A, said dogs being so arranged as to clamp the block above and below upon each side of the saw kerf, in a manner to prevent the block from pinching or binding the saw, when constructed and operating substantially as set forth.

47,450.—Bread Cutter.—John T. Plass, New York City:

I claim the knife, D, and bar, E, in combination with the automatically moving gage, J, all arranged to operate in the manner substantially as and for the purpose specified.

[This invention relates to a device for cutting or slicing bread, meat, vegetables, etc., for family or table use, and it consists in the employment of a knife and gage, arranged with or applied to a box so as to operate in a very efficient manner, for the purpose specified.]

47,451.—Coal-oil Lamp.—A. H. Platt, Yellow Springs, Ohio:

I claim the combination of the downwardly convex perforated basilar partition, B, and the perforated cap, C, having a degree of convexity downward less than the former, substantially as and for the purpose herein specified.

I also claim the combination of the flaring open base, A, perforated partition B, perforated cap, C, and deep flame opening, d, arranged and operating together, substantially as and for the purpose herein set forth.

47,452.—Pump.—Alex. F. Porter, Philadelphia, Pa.:

I claim, first, Constructing and arranging a cylindrical double-acting pump, having inlet through and exit passages, substantially as herein described, and adapting the same to the raising of oil or other liquids from deep wells, as set forth and explained.

I also claim fastening and supporting or securing a pump in a deep well, by accurately fitting it to the bore of said well and resting it upon legs or other supports, at the bottom of the well, through which legs or support the liquid is drawn into the pump, thus rendering the pump firm and steady, preventing vibration, the opening of the joints, and other injurious consequences arising from instability, substantially as herein described and represented.

47,453.—Balanced Slide Valve.—James Rankin, Detroit, Mich.:

I claim the lever, D, rocker, E, link, F, and lever, G, in combination with the piston, H, and slide valve, B, constructed and operating substantially and for the purpose set forth.

[The object of this invention is to balance the pressure of the steam on the back of a slide valve in such a manner that the same works equally free under a pressure of a hundred pounds or more to the square inch as it does in the open atmosphere. This object is obtained by combining with the valve a piston, through a series of intervening levers, rockers and links, in such a manner that the upward pressure of the steam on the piston counter balances the downward pressure on the back of the valve and the valve is perfectly balanced. Patented in this country and in Europe through the Scientific American Patent Agency.]

47,454.—Printing Press.—Henry Redlich, Chicago, Ill.:

I claim the peculiar manner of constructing the type cylinder, C, to wit, by means of the metal heads, F F', wooden heads, e e', nuts, G G, wooden segments, f, and removable types, h, substantially as herein described.

47,455.—Car Coupling.—John H. Reed, New Haven, Conn.:

I claim the combination of the bar, B B, with the lever, E E', and catch, b, when constructed, arranged and fitted to produce the required result, substantially as herein set forth and described.

Second, I claim the combination of the bar, B B, with the levers, l and k, and the spring, a a, when construced, arranged and fitted for uncoupling, substantially as herein described.

Third, I claim the combination of the lever, E E', with the coupling pin, c, and link, F, when constructed and fitted for use, substantially as herein described.

Fourth, I claim the combination of the lock lever, G, with the bar, B B, when combined, and made to operate substantially as herein described.

Fifth, I claim the combination of the draw head with the link, F, when constructed and fitted for use, substantially as herein described.

Sixth, I claim the combination of the link, t, with the pedal, g, when fitted to prevent coupling, substantially as herein described.

47,456.—Horse Power.—J. Wyatt Reid, New York City:

I claim the combination of the master wheel, F, arms, a a', stationary tubular spindle, A, platform, G, shaft, C, and one or more horizontal shafts, H, when constructed and arranged to operate as herein specified.

[This invention consists in constructing or arranging the several parts of the device in such a manner that power may be taken from different shafts having different degrees of speed, and machinery driven with a greater or less application of power, as circumstances may require.]

47,457.—Manufacture of Hard Rubber Articles.—George Samuel Rice, New York City:

I claim as a new article of manufacture, First, Watch cases or lockets made of hard rubber or vulcanite, in the manner hereinbefore set forth.

Second, In vulcanite watch cases or lockets, I claim the method of securing the hinge, substantially as described.

Third, In vulcanite watch cases or lockets, I claim forming an annular groove, with a thin overhanging rim, for the inserting and holding the glass, substantially as set forth.

Fourth, The method of securing the hard rubber shank to the hard rubber bezel, substantially as described.

Fifth, In combination with vulcanite watch cases or lockets, I claim the use of varnishes, in the manner and for the purpose set forth.

47,458.—Exploding Torpedoes in Artesian Wells.—Edward A. L. Roberts, New York City:

I claim, First, The priming chamber, b, in combination with the flask plug and nipple, substantially as described.

Second, The arrangement of the tube, f, or its equivalent, composed of india-rubber or other similar material, with the guard, d, and bolt, e, substantially as described, in combination with the flask.

47,459.—Vibrating Piston Engine.—John B. Root, New York City:

First, I claim the combination of a cylinder, A, of a form substantially as herein specified, and two vibrating pistons, D D*, occupying reversed positions within the said cylinder, and both connected with the same crank shaft, to operate substantially as herein set forth.

Second, So arranging the connections between the said vibrating pistons and the crank, that each piston, though being only single-acting, may act upon the crank during more than half of each revolution of the latter, substantially as herein described.

Third, The crank, E', arranged directly between the vibrating pistons, and within the cylinder of an engine, substantially as herein described, with a separate and independent connection with each piston, substantially as herein set forth.

Fourth, The connection of the side-packing strips, c', and end-packing strips, c2, of the piston, by means of pins, f, and slots, e, in combination with mortise and tenon joints, substantially as and for the purpose herein specified.

47,460.—Coffee Settler.—Wm. F. Rossman, Hudson, N. Y.:

First, I claim the hollow cone, A, with open base, having funnel, B, attached in combination with the perforated cup, C, all constructed substantially in the manner and for the purpose set forth.

Second, The open space between the base of the cone, A, and top or upper margin of funnel, B, and for the purpose described.

47,461.—Street-sweeping Machine.—Daniel Sargent, New York City:

I claim the adjustable scoop, E, and box, I, in combination with the three-armed hangers, F, adjustable brush, H, rock shafts, t t, hand levers, t, movable pinion, c, and wheel, B, constructed and operating substantially in the manner and for the purpose herein set forth

[An engraving and full description of this invention have been published in the Scientific American.]

47,462.—Adjustable Tension Device for Sewing-machine Shuttle.—Frederika Schenkl, Boston, Mass., administratrix of the estate of John P. Schenkl, deceased:

I claim the arrangement and combination of mechanism herein described, when made to operate substantially in the manner and for the purpose specified.

47,463.—Ships of War.—Charles Slater, Brooklyn, N. Y.:

First, I claim the hinged adjustable keel, C, applied in combination with the main keel, B, of a vessel, and with the vertically-adjustable rods, f, and ropes. c, all constructed, arranged and operating substantially as and for the purposes specified.

Second, The combination of the punches, H, piston, H', and steam cylinders, H2, constructed, arranged and operating as and for the purposes specified,

Third, The scuttling augurs, I, applied in combination with the horizontal shaft, i, and adjustable gear, p2, substantially as and for the purpose herein shown and described.

47,464.—Machine for Attaching Revenue Stamps.—Robert L. Smith, Stockport, N. Y.:

First, I claim the rack bar, F, and gate, D, with feed rollers, G G', and subjected to the action of a weight or spring, in combination with an automatic stop, c, and plunger, H, all constructed and operating substantially as and for the purpose set forth.

Second, Making the rack bar, F, removable, substantially as described, so that the machine can be readily adjusted for stamps of different width.

Third, The oscillating arm, l, and tappet, m, in combination with the stop, c, rack bar, F, handle, l, and plunger, H, constructed and operating substantially as and for the purpose specified.

Fourth, The rollers, G G, arranged in the longitudinal sliding gate, D, and operating in combination with the absorbent roller, q, and plunger, H, substantially as and for the purpose set forth.

Fifth, The employment of the elastic spring block, p, or its equivalent, in combination with the plunger, H, and metal edges, o, substantially as and for the purpose described.

[An engraving and full description of this machine have been published in the Scientific American.]

47,465.—Barrel-rolling Device.—Henry W. Stephenson, Cincinnati, Ohio:

I claim the frames. A A, crossed and pivoted at c, in combination with the disks, B B, the whole constructed and arranged so as to be capable of being applied to a barrel, substantially as and for the purpose described.

[This invention relates to a new and useful device for rolling barrels, designed more especially for the use of porters, laborers at railroad freight depots, etc., in order to facilitate the removal of barrels into and out from houses, freight depots, etc.]

47,466.—Coffee Pot.—Jnmes H. Swing, Cleveland, Ohio;

First, I claim the cup, d, and flange, b, in combination with the rim, l, annular chamber and section, A, as and for the purpose set forth.

Second, I claim the disk, h, strainer, f, and filter, B, in combination with the section, A, and cover, D, as and for the purpose herein described.

47,467.—Forge.—Charles N. Taylor and Elijah J. Holmes, Upton, Dedham, Mass.:

We claim the improved forge herein described with its removable plates, for the purpose of adapting it to the size and shape of the article to be heated.

47,468.—Corn Planter.—James C. Thomas, Redpoint, Md.:

I claim, First, The forked seed box, B, in combination with the wheel A, and the hollow tooth, C, when constructed substantially as and for the purpose specified.

Second, The circular rack, A, sector, B, lever, C, and arm, D, when the several parts are constructed and arranged substantially as and for the purpose herein set forth.

47,469.—Reclining Chair.—Hopkins Thompson, New York City:

I claim in combination with a clamp fastening on the stationary part of a reclining chair, a hinged brace bar jointed to one of the movable parts of a jointed reclining chair, substantially as described, whereby the movable parts may be clamped and braced rigidly to the stationary parts, substantially as set forth.

47,470.—Lock.—Benj. M. VarDerkeer, Clyde, N. Y.:

I claim the traverse or key dog, with its bolt, operated by the keys in locking and unlocking the latch, together with the spring catch in the head of the latch, which holds the dog in its linear or central position after having accomplished its mission.

47,471.—Pulley Block.—S. Van Hennick and T. Allen, New York City:

We claim the combination in a single pulley block of the small sheaves, a a', for carrying the rope or chain, B, to which the weight is attached, and the larger sheave, a'', attached rigidly to the first two, and carrying the rope or chain, D, to which the power is applied, all the parts being constructed and arranged to operate as herein specified.

[This invention consists in providing a pulley block with an extra or supplemental sheave of larger diameter than the others, and provided with an independent chain or rope, whereby considerable power is gained in operating the blocks, or in raising weights thereby.]

47,472.—Feed Rack.—John M. Van Nest, Claytown, Iowa:

I claim the combination of the sliding trough with the granary, the latter being provided with a spout or opening to discharge the feed into the trough, which moves beneath it, substantially as described.

47,473.—Vehicle.—Zalmon B. Wakeman, Rockford, Ill.:

I claim, in combination with the tongue, C, the swiveled box or bearing, F, having an eye or aperture increasing in size from front to back, and employed to receive and support the end of the brace rod, E, substantially in the manner and for the purpose explained.

Second, I claim the combination of the coiled spring, E', and nut, I, with the supporting rod, E, the nut permitting the spring to be contracted and expanded at will, for the purpose of varying the position of the tongue.

Third, I claim the tongue, L, employed in combination with the spring, E, rod, E, tongue, C, and nut. I, substantially as herein set forth.

Fourth, I claim the adjustable springs. K K, adapted to operate in connection with the knuckles, L I, in the manner and for the purposes set forth.

Fifth, I claim the spring or springs, J, wrapped around the tongue rod, and with their ends secured under the tongue bounds, and the forward axle or sand board adapted for adjustment in any manner, and employed for sustaining the tongue, C, as set forih.

47,474.—Stove.—George W. Walker, Boston, Mass.:

I claim a stove constructed with a sub-base separated from the main base by an air chamber or passage, and operating in the manner and for the purpose substantially as described.

Also the construction of a stove, with flues formed of the material of the outside of the stove body, and of the sheets within the body, when such flues are arranged to convey the products of combustion to heat a hollow extension of the base in front of the stove.

47,475.—Rolling Mill.—Edwin Wassell, Pittsburgh, Pa.:

I claim the use of a flanged guide roller, placed in front of a pair of rolls, when such roller is tapered between the flanges, for the purpose of causing the iron bar to slide sideways when it drops out from one pass between the rolls to the proper position in front of the next adjoining pass, substantially as described.

The use of a guide holder, consisting of the combination of a cylinder or box, d, rod, c, spring, i, and pressure screw, f, constructed substantially as and for the purpose hereinbefore set forth.

47,476.—Apparatus for Separating Ores.—James Watson, Cliff Mine, Mich.:

I claim, First, The hopper, A, provided with the deflecting board, C, chute or trough, D, and the opening, a, at its bottom, substantially as and for the purpose set forth.

Second, The chamber, B, below the hopper, communicating with the pipe or tube, E, provided with one or more plugs or faucets, and having water admitted into it under pressure, substantially as and for the purpose specified.

Third, The combination of the hopper, A, chamber, B, pipe or tube, E, provided with faucets or plugs, the deflecting band, C, and chute or trough, D, all arranged to operate substantially as and for the purpose set forth.

47,477.—India-rubber Packing Former.—Wm. Webster, Middletown, Ohio:

I claim the cylindrical packing former, A, for preparing India rubber annular packings for sealing fruit cans, in the manner described and represented in the accompanying drawings.

I also claim the pressure ring, x, or its equivalent, in combination with the flange or base, a, applied and used in the manner and for the purpose specified.

47,478.—Machine for Making Lanterns.—Wm. Westlake, Chicago, Ill.:

I claim the former or device constructed substantially as describ upon which to make lantern guards.

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47,479.—Train Way for Ferry Boats.—Norman W. Wheeler, Brooklyn, N. Y.:

First, I claim in connection with the deck, A, and coaming, D, the deflector or switch bar G, so arranged and operated as to slide the rear wheels outward, and cause them to describe the larger curve, substantially in the manner and for the purpose herein set forth.

Second, I claim in connection with the above the employment of the perforated or roughened plates, F F, of hard material, combined and arranged to operate in connection with the deflector, G, so as to afford a hold for the animals, and provide for the lateral movement or sliding of the wheels, substantially as and for the purposes herein described

47,480.—Tubular Condenser.—Norman W. Wheeler, Brooklyn, N. Y.

I claim the improvement in condensers and analagous tubular constructions herein described—to wit, the employment of the soft packing, G, and driven annulus, E, the latter holding itself in place and supporting and guiding the tube, D, and compressing the packing, G, substantially in the manner and with the effect herein set forth.

47,481.—Movable Berth.—Norman W. Wheeler, Brooklyn, N. Y.:

First, I claim in the described combination with a vessel the employment of the sockets, D D and E E, stanchions, F and H, the two or more berths, C' C2, and the free supporting stanchions, I and K, arranged substantially as and for the purposes described.

Second, I claim in connection with the above combination of hooks, links and stanchions, constructed and arranged to operate together substantially in the manner and for the purposes described.

47,482.—Landing Platform for Steamboats and other Vessels.—Norman W. Wheeler, Brooklyn, N. Y.:

First, I claim the construction and use of an adjustable bridge, B, permanently attached to a vessel, A, and arranged to allow of its being turned in board, and operated by the hoisting means in both positions, substantially in the manner as herein set forth.

Second, I claim in combination with an adjustable bridge the yielding and rolling hinges, G A' B', arranged to operate in the manner and for the purposes substantially as herein set forth.

Third, I claim the within described arrangement of the jib stay, H, continuations, h h, and rigid post, I, for the purpose herein set forth

47,483.—Bottle Stopper.—E. R. Wilbur, New York City:

I claim the bottle stopper above shown, constructed and applied substantially as described.

47,484.—Railway Chairs.—J. E. Williams, Xenia, Ohio:

First, I claim supporting the joints of rails by means of a two part chair resting upon and bridging the space between two separate ties, with lips, b b, extending the entire length, and flanges, c c, extending below and falling between the ties, the parts being clamped and held by the bolts, e e, or their equivalents, substantially in the manner herein described.

In combination with the foregoing, I claim the block of wood, f, for the purpose specified.

47,485.—Shield for Breaststraps.—Henry F. Wilson, Elyria, Ohio:

I claim the reversed hooks having their upper ends covered so as to correspond to the inner circle of the ring for the purpose of giving the greatest possible length to the hooks, and at the same time admit the ring freely, the whole being constructed and operating in the manner and for the purpose described.

47,486.—Plow.—T. Winslow, Cleveland, Ohio:

I claim the herein described construction of plows, the distinguishing feature being the relative position of the lower edge of the mold board to the land side substantially as herein set forth, thus forming in one implement a common and subsoil plow.

47,487.—Braiding Machine for covering Skirt and other Wires.—Oliver R. Burnham, (assignor to J. I. and J. O. West) New York City:

First, I claim the uniting by a braided covering of the wires, held separately and apart until the point of braiding, and the bringing them together at the point, so as to braid them just before, or as they are brought together side by side or parallel, and then the twining them edge to edge, during the continuous movement of the wires, so as to strain and tighten the braid upon the wires as described.

Second, I claim the construction and use of the guide and supporting pieces, b b, with the apertures in the same, for the passage of the wires by which the wires are supported and directed to the point of braiding, without interfering with the motion of the bobbins or threads, in the manner and for the purposes described.

Third, I claim the guide-piece, e, constructed and operating in the manner and for the purposes described, by which the wires are brought and kept together, as they ascend, at the required point for braiding, and at the same time the continuous and unobstructed passage of the wires and their joints is provided for, as the braiding proceeds and is completed.

Fourth, I claim the application and use of the pressure and delivery rollers whether with or without the guide piece, P, combined with the apparatus above described underneath, by the combined operation of which the wires are twined edge to edge by a gradual progress from their position of side by side, at the same time that they are conducted away as completed.

47,488.—Knitting Machine Needles.—Augustus C. Carey. Lynn, Mass., assignor to himself and Geo. S. Sullivan, Boston, Mass.:

I claim the combination in a machine knitting needle of a latch with an elongated flexible hook that extends upwards nearly parallel with the shank of the needle, and to such a distance or length as to reduce the angle that the latch makes with the shank, thus forming a narrow or slim needle that can be used for fine work, substantially as herein described.

47,489.—Heating and Fuel Device.—Daniel C. Colby (assignor to himself, D. W. Rawson, J. Reddington and Thomas I. Harris), Claremont, N. H.:

I claim the arrangment of the damper, H, the pipe, G, and the orifice, j on the upper end of the funnel, B, the damper, I, the pipe, F, and the orifice, k, on the other end substantially as described, and the combination of the funnel, B, thus provided, with the outer funnel, A, and the stove, C, one or both, as and for the purposes set forth.

47,490.—Cotton Press.—Geo. C. Davies, (assignor to Ohio Erolin Company,) Dayton, Ohio:

I claim, First, The provision in a baling press of the screw, B, winged nut, C c, vertical guides, D and a, toggles, G G', rods, F, platform, E, and baling trunk, H, in the described combination with the swinging platten, I, the whole being arranged and operating substantially as set forth.

Second, I claim the suspended platten or abutment, I, articulated to the frame, by means of the links, K K', and pintles, L L', so as to be capable of being swung to one side for filling or charging the baling trunk in the manner described.

47,491.—Game Boards.—James T. Edson, Stowe, Mass.: assignor to himself and Geo. L. Crosby, Berlin, Mass.:

I claim the combination of the groove, B, and the passage, b, leading therefrom, with the game board, A, and the receiver, c.

47,492.—Valve Gear for Steam Engines.—Chapman E. Gage, (assignor to Columbia Drew,) Winona, Minn.:

I claim the sliding valve rods, 14 14, constituting supports and guides for the bar, 7, which imparts movement to the valve rods by coming in contact with the shoulders, 5 13, and thus effect the alternate opening and closing of the proper induction and exhaust parts.

47,493.—Lamp.—Alonzo Hicks, Factoryville, N. Y., assignor to himself and Leoniel Jacobs, New York City:

I claim the combination of the diaphragm, d, deflectors, i i', guards, f f, and wick tube, c, in the manner and for the purposes specified.

47,494.—Composition for Preparing Ribbons for Hand Stamps.—Horace Holt, (assignor to W. W. Secombe,) New York City:

I claim the within described composition applied to a ribbon, substantially as and for the purpose set forth.

47,495.—Horse-shoes and Calks.—Charles H. Johnson (assignor to himself and Charles E. Woodman), Boston, Mass.:

I claim as my invention the combination of the fastening flange, a, and the mortise, b, with the corresponding socket, c, and tenon, d, of the calk, and with one or more bolts, a', or equivalents, extending through the flange and the calk, substantially as specified.

47,496.—Composition for Lining Oil Barrels.—Henry Loewenberg, New York City, assignor to himself and Emile Granier, Paris, France:

I claim the use of a compound of the ingredients herein described, viz,, of glue, acid and sirup, and mixed together substantially in the manner and about in the proportion set forth.

47,497.—Process for Treating Auriferous Ores—W. Adolf Ott (assignor to himself and Henry Jackson), Brooklyn, N. Y.:

I claim the use, in treating auriferous ores, and particularly pyrites containing gold, of hypochlorous acid, substantially in the manner herein set forth.

[This invention consists in the employment or use of a mixture of hypochlorous acid in extracting gold from auriferous ores, and particularly from pyrites containing gold.]

47,498.—Feed Bag.—Henry Pennie and Chnnock (assignors to themselves and Levi Bissell), New York City, and reassigned by L. Bissell to said Pennie and Chinnock:

We claim a feed bag, or portable crib, for a horse or other animal, so constructed that it may be at the same time suspended from the head and attached to or near the breast of the animal, and when so suspended and attached may have its bottom inclined downward toward or from the animal's mouth, by the downward and upward movements of his head, substantially as and for the purpose herein described.

47,499.—Feed Water Heater.—Robert Poole (assignor to himself and German H. Hunt), Baltimore, Md.:

I claim the manner in which I have arranged and combined the tank, A, with regard to the inlet and outlet water pipes connected with it, the scatterer, and the branch pipe leading from the ordinary exhaust or waste pipe to its interior for the purpose of heating the water passing through said tank without interfering with the free escape of the steam through said exhaust or waste pipe, substantially as herein described.

47,500.—Fastening for Harness.—Josiah Shepard, New Britain, Conn., assignor to himself and Richard Butler, New York City:

I claim a strap fastening for harnesses and for similar purposes, composed of two carved side pieces, a a, connected at their ends by cross pieces, b b' b'', placed relatively with each other as shown, and the center cross piece, b', provided with a central piece, c, substantially as described.

47,501.—Floating Dock.—Edward Turner (assignor to Simon R. Golibart), Baltimore, Md.:

I claim, First, So constructing a floating dock that a vessel may be raised bodily out of water and suspended between floats or pontoons upon vertically adjustable frames or elevators substantially as described.

Second, The use of vertically adjustable frames, D D, in combination with pontoons, A A, and mechanism applied to these latter, which is adapted for adjusting the frames independently of each other or simultaneously, substantially as described.

Third, The employment of guides, D' D', in conjunction with the elevating frames, D D, and floats, A A, substantially as described.

47,502.—Horse-shoe.—Alexander Tyrrell (assignor to himself and Kimball Ferrin), Batavia, N. Y.:

I claim a horse-shoe, constructed as described, with the recesses, a a, made at any point between the heel and toe, for the purposes specified.

47,503.—Capsules for Preventing the Soiling of Fire-arms.—F. L. M. Dorvault, Paris, France:

I claim the employment or use of self-discharging capsules, substantially as herein described, in combination with fire-arms, to prevent them from soiling, as set forth.

47,504.—Medicated Candy.—Lazarus Morgenthau, Mannhiem, Baden:

First, I claim the combination of sugar with an extract from the young shoots of the pine tree, substantially in the manner and for the purpose herein set forth.

Second, I claim the compound formed of the several specific ingredients in the proportions herein set forth.

47,505.—Mode of Disintegrating Vegetable Substances for Paper Pulp.—Zephirin Gaspard, Alozandre Nathan Petrone Orioli, Amable Alfred Fredet and Pierre Amable Henri Matussievare, Paris, France:

We claim the within-described process for disintegrating vegetable materials by the application of aqua regia, substantially in the manner herein set forth.

47,506.—Manufacture of Iron and Steel.—Geo. Parry, Ebro Vale Iron Works, Eng. Patented in England Nov. 18, 1861:

I claim the process above described, whereby I am enabled to produce purified wrought iron and hard or soft cast-steel in large masses, in an economical manner.

REISSUES.

1,940.—Enema Syringe—Hamilton D. Lockwood, Charlestown, Mass., assignee of C. H. & H. E. Davidson. Patented March 31, 1857:

What is claimed as the invention of Charles H. and Herman E. Davidson, is a syringe, having an elastic bulb or chamber, flexible tubes, and a suitable valvular or arrangement, when organized so as to operate substantially as described.

1,941.—Folding Bed Bottom.—Frederick C. Payne, New York City. Patented March 29, 1864:

I claim, First, The connection of the two parts, A A', of the frame or box of a folding bed bottom or mattress on each side thereof, by means of a double hinge composed of a plate, d, pivoted to the said parts, A A', at two points, at such a distance apart as to make room for the stuffing between the said parts, when folded parallel with each other, substantially as herein described.

Second, The blocks, D D, in combination with the plates, d, and the recesses, i i, in the connected ends of the two portions, A A', of the box or frame, substantially as and for the purpose specified.

1,942.—Hot Air Engine.—Stephen Wilcox, Jr., Westerly, R. I. Patented Nov. 20, 1860:

I claim, First, In combination with an air engine in which the air and gases are heated by combustion within the cylinder or in a chamber leading thereto, the use of a regenerator, F, substantially as and for the purposes herein described.

Second, Gradually supplying the combustible gas or vapor for a gas engine operating substantially as herein described, as it is consumed and in the proper quantity for each stroke by means of the pump, G, or its equivalent, for the purpose set forth.

Third combining a quantity of cooler air with the products of combustion by the combined action of piston, b, and valve, M, or their equivalents, substantially as described, for the purpose of preserving a safe degree of heat within the cylinders as above set forth.

Fourth, The supplemental valve, m, arranged and operating substantially as and for the purpose herein specified.

Fifth, The arrangement of the heated evaporator, N, and cooler reservoir, O, in combination with an engine operating with the direct pressure of the products of combustion, with or without the pump, G, substantially in the manner and for the purpose herein set forth.

Sixth, Placing a piece of fire brick, L, or equivalent substance, in close proximity to the burner, j k, for the purpose above specified.

Seventh, In an engine operated with the direct pressure of the products of combustion and having the working cylinder and the combustion chamber arranged upon a single portable base, x, I claim the arrangement of the furnace casing and the working cylinder in the additional casing, S, common to both, with air or other non-conducting substance filling the intervening space, substantially as and for the purpose herein set forth.

Eighth, I claim in such engines in combination with provisions for reducing the temperature of the products of combustion before their admission to the cylinder as shown, the employment of the thick, non-conducting piston, a, working in a vertical cylinder and having its packing widely removed at all times from the heated parts of the apparatus, all arranged substantantially as and for the purpose herein set forth.

PATENTS

GRANTED

FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication o the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-THIRD of a the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *seventeen years'* experience in preparing specifications and drawings for the United States Patent Office the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from the three last ex-Commissioners of Patents.

MESSRS. MUNN & Co.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter.

MESSRS. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & Co.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out patents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue Address MUNN & CO., No 37 Park Row, New York.

THE VALIDITY OF PATENTS.

Persons who are about purchasing patent property, or patentees who are about erecting extensive works for manufacturing under their patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing patent, before making large investments. Written opinions on the validity of patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited. For further particulars address MUNN & CO., No. 37 Park Row, New York.

The Patent Laws, enacted by Congress on the 2d of March, 1861 are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the

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shortest time by sending a sketch and description of the invention. the Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject giving a brief history of the case, inclosing the official letters, &c.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row New York.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

FOREIGN PATENTS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers. Brussels. They thing they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO'S Agency, the requirements of different Government Patent Offices, &c., may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

COPIES OF PATENT CLAIMS.

MESSRS. MUNN & CO., having access to all the patents granted since the rebuilding of the Patent Office, after the fire of 1836, can furnish the claims of any patent granted since that date, for $1.

EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort of extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

Patents may be extended and preliminary advice obtained, by consulting, or writing to, MUNN & CO., No. 37 Park Row, New York.

UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model, is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.

Notes and Queries

F. S. C., of Mass.—Simple as the rule for nominal horse-power of an engine is, it seems that many persons get very much befogged on it. The number of inches of area in the piston is to be multiplied by the steam pressure on each inch of said area, which will give the total pressure on the piston. The sum thus obtained is multiplied by the feet per minute which the piston travels; divide the sum by 33,000, the mechanical expression of one horse power, and we have what purports to be the force of the engine. We can't make the matter any simpler, and we have answered this question about once a week for the last five years.

H. H., of Wis.—We cannot tell you the exact quantity of glycerine to put in plaster to keep it soft, but it would be a very simple matter to try a little, and thus ascertain by experiment.

J. G. P., of Pa.—Your cast-iron pulley can be turned with a chilled iron tool. Make an iron mold of a tool, in shape like a fence picket—flat on top, a little round on the end, and with but little rake; cast a tool of white iron, face down, in this mold, and you will succeed without taking off the scale. Run the pulley very slow, and take light cuts. Do not grind the tool but very little.

F. A. Y., of Ohio.—If you examine the SCIENTIFIC AMERICAN you will find many boilers illustrated therein; perhaps some of them will suit your purpose.

E. P. A., of Conn.—India-rubber is insoluble in alcohol. One part of rubber dissolved in sixty-four of chloroform will make a transparent cement, and resist alcohol and linseed oil.

J. K. L., of Kansas.—You say you sent us a year ago a query and a drawing, with a request to work out an elaborate calculation of the power of a certain windmill, and what weight it would require to run a set of mill-stones by a tram of gears, and you complain that you have never seen any answer thereto. We answered you at that time that we cannot engage to make calculations of the power of windmills or other machinery for individuals; all that we do in that line is furnished for general reading.

W. D., of Ill.—We can recommend the *Tinman's Manual* and *Mechanic's Handbook* for your purpose. J. K. Butts & Co., publishers, Washington street, Boston, Mass.

C. T. G., of Ill.—You will find it cheaper to buy malleable iron castings from those who have works erected to make them than to erect works for a small quantity. We cannot give a description of the process in a few lines, but malleable iron is simply annealed cast-iron. It requires time—nearly three weeks—and experience to conduct the operation.

G. B. D., of Md.—There is no ground to write an article upon the manufacture of seamless brass tubes. They are cast in a short, thick ingot or cylinder, and drawn through dies, and annealed after every drawing.

F. S. C., of Mass.—According to the laws regulating the velocities of falling bodies, all substances fall through an equal space in the same time

C. D. W., of Mass.—To charge a bar of steel with magnetism, place the end of a magnet upon the side of the bar at one end and draw it to the other end, then return the magnet through the air and repeat the stroke, making the passes always in the same direction. Soft iron loses its magnetism instantly.

J. L. G., of N. Y.—If one pound of sulphur be thoroughly mixed with six or eight pounds of india-rubber and pressed in a mold, at a temperature of 300°, it will be vulcanized by the operation, and will afterward retain its form.

D. H. W., of N. Y.—The easiest way for you to divide a circle into any given number of equal parts, we presume, would be by simply trying it with your dividers. In plane geometry, however, you will find the relations of the diameter of a circle to the sides of inscribed polygons. You will probably find the meaning of all those words in any large dictionary.

R. D. R., of Tenn.—The gnomon of a sun-dial must point to the pole of the heavens, and to do this it must be inclined at an angle from the horizon corresponding to the latitude of the place where the dial is located, and set due north. Perhaps the needle in your locality deviates from the north.

NOTICE TO SUBSCRIBERS.

The first five numbers of the present volume of the SCIENTIFIC AMERICAN being out of print, we shall commence the time of each new subscriber from the date of receipt of the order, unless the writer states specifically that he wishes such back numbers as can be furnished.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

PERSONS WISHING TO SAVE FUEL BY A SIMPLE attachment to their steam engines, please apply to Box 641, P. O., Newburgh, N. Y. 1*

PLATINA—WHOLESALE AND RETAIL—FOR ALL purposes. H. M. RAYNOR, Importer, No. 748 Broadway, New York. Platinum Scrap of any sort purchased. 19 4*

GUN AND PISTOL SCREWS.—COMSTOCK, LYON & CO., Manufacturers (Office 74 Beekman street, New York), are always prepared to furnish Gun and Pistol Screws to sample, Screws to fit U. S. Musket, Sewing-machine Screws, and Metal Screws generally, of the best quality, at short notice. All 19 20*

WINSLOW, GRISWOLD & HOLLEY, MAKERS OF BESSEMER CAST-STEEL—Troy, N. Y., April 15, 1865.—Having commenced the manufacture of Cast-steel under the Bessemer Patents, we are now prepared to furnish Railway Tires without welds, Rails, Axles, Piston and Connecting Rods, Crank Pins, Boiler and Ship Plates, Shafting, Cannon and Projectiles, Bars and Rods, Spring Steel, Forgings to shape, Ingots, and Machinery Castings to pattern, of this material, up to 5,000 pounds weight. Preparations are making to produce masses of 25 000 pounds weight.

This manufacture, developed by Mr. Bessemer in 1856, has already reached a production of about 100,000 tuns per year in England and on the Continent, and is largely superseding wrought iron for the purposes named above. Railway companies, like the London and North-Western, and Iron Works like the Ebbw Vale and Dowlais, have erected apparatus to produce 200 to 500 tuns each per week. Bessemer Steel has more recently been used in the United States in the form of Axles, Rails and Plates.

The grand advantage of this material over wrought iron, especially in large masses, is its perfect homogeneity—the absence of welds and consequent imperfections, such as the lamination of rails, blisters in boiler plates, and cold-shuts in heavy forgings.

Its tenacity is double that of wrought iron, considering the above-mentioned and unavoidable defects of wrought iron in welded masses. In the bar, it is one-half greater than that of wrought iron, or from 90,000 to 1:0,000 pounds per square inch, according to the degree of carbonization required for different purposes.

The nature of the Bessemer process renders the product more uniform than wrought iron can be, in all its qualities.

The stiffness of this steel, proportionate to its tenacity, adapts it to girder and ship building, and peculiarly fits it to resist compressive as well as tensile strains, as in piston rods.

While the elasticity, and hence the safe working load of the lowest steel is much greater than that of wrought iron, its ductility is equal to that of the best wrought iron. Two-inch bars may be bent double when cold under the steam hammer. This property insures its safety in the form of axles and tires.

The hardness of the material, as well as its homogeneity, increases its durability in the form of rails, guns, and parts subjected to abrasion.

This steel is peculiarly adapted to plates requiring intricate flanging, and subject to the immediate contact of fire. For a given strength it may be thinner than wrought iron; it does not blister, and the carbon in it protects it against corrosion.

We are also prepared to grant licenses, upon reasonable terms, for the manufacture of Bessemer Steel in the United States, and to furnish working drawings for the necessary plans and machinery.

We are aware that there are other claimants for this process of making Steel, but we have purchased the Bessemer Patents and erected Works, after a legal investigation, which satisfies us that these other claims are not well founded, and that both the process and the machinery necessary to practice the process successfully, are the inventions of Mr. Bessemer.

And we take this opportunity to caution all persons who are desirous of entering upon the manufacture of steel by this process, that should they employ it under cover of alleged rights of any parties, other than ourselves as the assignees in the United States of Mr. Bessemer, we shall hold them legally responsible to us in damages. [1] WINSLOW, GRISWOLD & HOLLEY.

ANDREWS' PATENT CENTRIFUGAL PUMPS—CAPACITY from 90 to 40,000 gallons per minute. For draining and irrigating lands, wrecking, cofferdams, condensers, cotton, wool and starch factories, paper mills, tanneries and all places where a large and constant supply of water is required, these pumps are unequalled. They are compact, require little power, and are not liable to get out of order. For descriptive pamplet address 19 4 WM. D. ANDREWS & BRO., No. 414 Water street, N. Y.

WAIT'S IMPROVED JONVAL TURBINE WATER Wheel is the most powerful, durable and economical wheel ever offered to the public. Every one who contemplates putting in a new wheel to drive any kind of machinery should become acquainted with these wheels before purchasing any other. Circulars sent on application. Address P. H. WAIT, Hydraulic Engineer, Sandy Hill, N. Y. 19 3*

FOR SALE—STATE RIGHTS OF MY PATENT Portable Musketo Bar. It is easy to manufacture and requires but little capital. The patent was issued last year, and a large quantity of them have been sold in this State. They weigh but two ounces and are better than any others in use. Any one introducing them in the South can realize a fortune. Address JOHN ZENGELER, Chicago, Ill. P. O. Box 2,682. 19 2*

PORTABLE ENGINES, SUITABLE FOR THE OIL regions, from 8 to 20-horse power, with large fire-place, independent steam feed pump, steam gage and improved water heater. The most complete and simple engines in the market. For particulars address 19 4 WM. D. ANDREWS & BRO., No. 414 Water street, N. Y.

SPECIAL NOTICE TO METAL WORKERS.—THE drills made by us are standard tools, and are sold at lower prices than they can be made by individuals. They are of all sizes from a knitting needle up to 1½ inches, and drill a hole that needs no rimming. Used in the U. S. Navy Yards and by machinists and metal workers generally. Can be seen in daily use in this city at CHAS. BROMBACHER'S, No. 77 Ann street, and at this office. Every metal worker needs them. Address MANHATTAN FIRE ARMS CO., Newark, N. J. 19 4

FOR SALE—A MACHINE SHOP, AND TOOLS FOR Manufacturing Carriage Bolts, Nuts and Washers together or separately. No competition, and large trade already established. A rare opportunity is offered. Address CHAS. H. RICE & CO., Chicago. 1*

TRAVELING AGENTS WANTED.—LARGE PROFITS and little capital required. A new invention. Samples free by mail for 50 cents. Inclose stamps for particulars to W. B. DIVON, No. 108 William street, N. Y. 1*

ONE MILLION DOLLARS.—VALUABLE RUBBER Patent and other inventions for sale. I am a cripple, and cannot get out to show my inventions, but if you wish to invest in a really valuable patent, or secure a monopoly in the use of Vulcanized Rubber, call and see my models and samples. I have a better Knob Door Latch than there is in market, and other things in the Hardware Line that will please you. Also a patent for Sash, Door and Blind makers. Call and see me or address GEO. J. COLBY, 1* No. 15 Laight street, N. Y.

CHEAP SOAP.—SAPONIFIER OR CONCENTRATED LYE—The Ready Family Soap-maker. Soap for three cents per pound. See SCIENTIFIC AMERICAN March 18, 1865. Caution—Original, Genuine and Patented article is put up in one-pound iron cans, all others being counterfeit. Manufactured by PENNSYLVANIA SALT MANUFACTURING CO., Office Pitt street and Duquesne way, Pittsburgh, Pa. 1

MILLING MACHINE WANTED—OF LARGE SIZE and modern construction. Also a small Index Milling Machine. Address UNION VISE CO., No. 57 Haverhill street, Boston, Mass. 1*

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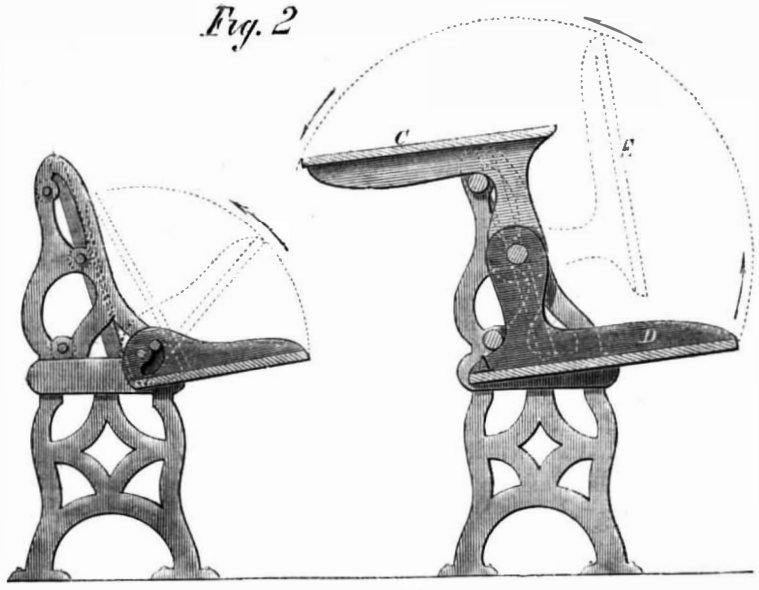
Fig. 1.

Fig. 2



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